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ABSTRACT

This Unified Sciences and Mathematics for Elementary Schools (USMES) unit challenges students to find a good way to tell many people about a topic/problem (vandalism, playground safety, teaching the metric system). The challenge is general enough to apply to many problem-solving situations in mathematics, science, social science, and language arts at any elementary school level (grades 1-8). The Teacher Resource Book for the unit is divided into five sections. Section I describes the USMES approach to student-initiated investigations of real problems, including a discussion of the nature of USMES "challenges." Section II provides an overview of possible student activities with comments on prerequisite skills, instructional strategies, suggestions when using the unit with primary grades, a flow chart illustrating how investigations evolve from students' discussions of mass communications problems, and a hypothetical account of intermediate-level class activities. Section III provides documented events of actual class activities from grades 2, 5/6, and 6. Section IV includes lists of "How To" cards and background papers, bibliography of non-USMES materials, and a glossary. Section V consists of charts identifying skills, concepts, processes, and areas of study learned as students become involved with the activities. (JN)

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This book is a resource developed by the USMES Project: Earle L. Lomon, Project Director, Betty M. Beck, Associate Director for Development, Thomas L. Brown, Associate Director for Utilization Studies, Quinton E. Baker, Associate Director for Administration.

UNIFIED SCIENCES AND MATHEMATICS FOR ELEMENTARY SCHOOLS:
Mathematics and the Natural, Social, and Communications Sciences in
Real Problem Solving.

Mass Communications

Second Edition

Cocker Spani

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Trial Edition

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CHALLENGE: FIND A GOOD WAY FOR US TO TELL MANY PEOPLE ABOUT __________(TOPIC, PROBLEM).

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Preface

The USMES Project

Unified Sciences and Mathematics for Elementary Schools: Mathematics and the Natural, Social, and Communications Sciences in Real Problem Solving (USMES) was formed in response to the recommendations of the 1967 Cambridge Conference on the Correlation of Science and Mathematics in the Schools.* Since its inception in 1970, USMES has been funded by the National Science Foundation to develop and carry out field trials of interdisciplinary units centered on long-range investigations of real and practical problems (or "challenges") taken from the local school/community environment. School planners can use these units to design a flexible curriculum for grades kindergarten through eight in which real problem solving plays an important role.

Development and field trials were carried out by teachers and students in the classroom with the assistance of university specialists at workshops and at occasional other meetings. The work was coordinated by a staff at the Education Development Center in Newton, Massachusetts. In addition, the staff at EDC coordinated implementation programs involving schools, districts, and colleges that are carrying out local USMES implementation programs for teachers and schools in their area.

Trial editions of the following units are currently available:

- Advertising
- Bicycle Transportation
- Classroom Design
- Classroom Management
- Consumer Research
- Describing People
- Designing for Human Proportions
- Design Lab Design
- Eating in School
- Getting There
- Growing Plants
- Manufacturing
- Mass Communications
- Nature Trails
- Orientation
- Pedestrian Crossings
- Play Area Design and Use
- Protecting Property
- School Rules
- School Supplies
- School Zoo
- Soft Drink Design
- Traffic Flow
- Using Free Time
- Ways to Learn/Teach
- Weather Predictions

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*See *Goals for the Correlation of Elementary Science and Mathematics*, Houghton Mifflin Co., Boston, 1969.

USMES Resources

In responding to a long-range challenge, the students and teachers often have need of a wide range of resources. In fact, all of the people and materials in the school and community are important resources for USMES activities. In addition USMES provides resources for both teachers and students. A complete set of all the written materials comprise the USMES library, which should be available in each school using USMES units. These materials include--

1. *The USMES Guide*: This book is a compilation of materials that may be used for long-range planning of a curriculum that incorporates the USMES program. It describes the USMES project, real problem solving, classroom strategies, the Design Lab, the units, and the support materials as well as ways that USMES helps students learn basic skills.

2. *Teacher Resource Books* (one for each challenge): Each of these guides to using USMES units describes a broad problem, explains how students might narrow that problem to fit their particular needs, recommends classroom strategies, presents edited logs from teachers whose classes have worked on the unit, and contains charts that indicate basic skills, processes, and areas of study that students may learn and utilize.

3. *Design Lab Manual*: This guide helps teachers and administrators set up, run, and use a Design Lab--a place with tools and materials in which the students can build things they need for their work on USMES. A Design Lab may be a corner of a classroom, a portable cart, or a separate room. Because many "hands-on" activities may take place in the classroom, every USMES teacher should have a Design Lab Manual.

4. *"How To" Series*: These student materials provide information to students about specific problems that may arise during USMES units. The regular *"How To" Series* covers problems in measuring, graphing, data handling, etc., and is available in two versions--a series of

cartoon-style booklets for primary grades and a series of magazine-style booklets with more reading matter for upper grades. The *Design Lab "How To" Series* is available in two illustrated card versions--one for primary grades and one for upper grades. A complete list of the *"How To" Series* can be found in the *USMES Guide*.

5. Background Papers: These papers, correlated with the *"How To" Series*, provide teachers with information and hints that do not appear in the student materials. A complete list can be found in the *USMES Guide*.

6. *Curriculum Correlation Guide*: By correlating the twenty-six USMES units with other curriculum materials, this book helps teachers to integrate USMES with other school activities and lessons.

The preceding materials are described in brief in the USMES brochure, which can be used by teachers and administrators to disseminate information about the program to the local community. A variety of other dissemination and implementation materials are also available for individuals and groups involved in local implementation programs. They include *Preparing People for USMES: An Implementation Resource Book*, the USMES slide/tape show, the Design Lab slide/tape show, the Design Lab brochure, videotapes of classroom activities, a general report on evaluation results, a map showing the locations of schools conducting local implementation of USMES, a list of experienced USMES teachers and university consultants, and newspaper and magazine articles.

* * * * *

Because Tri-Wall was the only readily available brand of three-layered cardboard at the time the project began, USMES has used it at workshops and in schools; consequently, references to Tri-Wall can be found throughout the Teacher Resource Books. The addresses of suppliers of three-layered cardboard can be found in the Design Lab Manual.

Introduction

Using the Teacher Resource Book

When teachers try a new curriculum for the first time, they need to understand the philosophy behind the curriculum. The USMES approach to student-initiated investigations of real problems is outlined in section A of this Teacher Resource Book.

Section B starts with a brief overview of possible student activities arising from the challenge; comments on prerequisite skills are included. Following that is a discussion of the classroom strategy for USMES real problem-solving activities, including introduction of the challenge, student activity, resources, and Design Lab use. Subsequent pages include a description of the use of the unit in primary grades, a flow chart and a composite log that indicate the range of possible student work, and a list of questions that the teacher may find useful for focusing the students' activities on the challenge.

Because students initiate all the activities in response to the challenge and because the work of one class may differ from that undertaken by other classes, teachers familiar with USMES need to read only sections A and B before introducing the challenge to students.

Section C of this book is the documentation section. These edited teachers' logs show the variety of ways in which students in different classes have worked at finding a solution to the challenge.

Section D contains a list of the titles of relevant sets of "How To" Cards and brief descriptions of the Background Papers pertaining to the unit. Also included in section D is a glossary of the terms used in the Teacher Resource Book and an annotated bibliography.

Section E contains charts that indicate the comparative strengths of the unit in terms of real problem solving, mathematics, science, social science, and language arts. It also contains a list of explicit examples of real problem solving and other subject area skills, processes, and areas of study learned and utilized in the unit. These charts and lists are based on documentation of activities that have taken place in USMES classes. Knowing ahead of time which basic skills and processes are likely to be utilized, teachers can postpone teaching that part of their regular program until later in the year. At that time students can study them in the usual way if they have not already learned them as part of their USMES activities.

A. Real Problem Solving and USMES

> *If life were of such a constant nature that there were only a few chores to do and they were done over and over in exactly the same way, the case for knowing how to solve problems would not be so compelling. All one would have to do would be to learn how to do the few jobs at the outset. From then on he could rely on memory and habit. Fortunately--or unfortunately depending upon one's point of view--life is not simple and unchanging. Rather it is changing so rapidly that about all we can predict is that things will be different in the future. In such a world the ability to adjust and to solve one's problems is of paramount importance.**

Real Problem Solving

USMES is based on the beliefs that real problem solving is an important skill to be learned and that many math, science, social science, and language arts skills may be learned more quickly and easily within the context of student investigations of real problems. Real problem solving, as exemplified by USMES, implies a style of education which involves students in investigating and solving real problems. It provides the bridge between the abstractions of the school curriculum and the world of the student. Each USMES unit presents a problem in the form of a challenge that is interesting to children because it is both real and practical. The problem is real in several respects: (1) the problem applies to some aspect of student life in the school or community, (2) a solution is needed and not presently known, at least for the particular case in question, (3) the students must consider the entire situation with all the accompanying variables and complexities, and (4) the problem is such that the work done by the students can lead to some improvement in the situation. This expectation of useful accomplishment provides the motivation for children to carry out the comprehensive investigations needed to find some solution to the challenge.

The level at which the children approach the problems, the investigations that they carry out, and the solutions that they devise may vary according to the age and ability of the children. However, real problem solving involves them, at some level, in all aspects of the problem-solving process: definition of the problem; determination of the important factors in the problem; observation; measurement; collection of data; analysis of the data using graphs, charts, statistics, or whatever means the students can find; discussion; formulation and trial of suggested solutions; clarification of values; decision making; and communications of findings to others. In addition, students become more inquisitive, more cooperative in working with others, more critical in their thinking, more self-reliant, and more interested in helping to improve social conditions.

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*Kenneth B. Henderson and Robert E. Pingry, "Problem-Solving in Mathematics," in *The Learning of Mathematics: Its Theory and Practice*, Twenty-first Yearbook of the National Council of Teachers of Mathematics (Washington, D.C.: The Council, 1953), p. 233.

The USMES Approach

To learn the process of real problem solving, the students must encounter, formulate, and find some solution to complete and realistic problems. The students themselves, not the teacher, must analyze the problem, choose the variables that should be investigated, search out the facts, and judge the correctness of their hypotheses and conclusions. In real problem-solving activities, the teacher acts as a coordinator and collaborator, not an authoritative answer-giver.

The problem is first reworded by students in specific terms that apply to their school or community, and the various aspects of the problem are discussed by the class. The students then suggest approaches to the problem and set priorities for the investigations they plan to carry out. A typical USMES class consists of several groups working on different aspects of the problem. As the groups report periodically to the class on their progress, new directions are identified and new task forces are formed as needed. Thus, work on an USMES challenge provides students with a "discovery-learning" or "action-oriented" experience.

Real problem solving does not rely solely on the discovery-learning concept. In the real world people have access to certain facts and techniques when they recognize the need for them. The same should be true in the classroom. When the students find that certain facts and skills are necessary for continuing their investigation, they learn willingly and quickly in a more directed way to acquire these facts and skills. Consequently, the students should have available different resources that they may use as they recognize the need for them, but they should still be left with a wide scope to explore their own ideas and methods.

Certain information on specific skills is provided by the sets of USMES "How To" Cards. The students are referred only to the set for which they have clearly identified a need and only when they are unable to proceed on their own. Each "How To" Cards title clearly indicates the skill involved--"How to Use a Stopwatch," "How to Make a Bar Graph Picture of Your Data," etc. (A complete list of the "How To" Cards can be found in Chapter IX of the USMES Guide.)

Another resource provided by USMES is the Design Lab or its classroom equivalent. The Design Lab provides a central location for tools and materials where devices may be constructed and tested without appreciably disrupting other classroom activities. Ideally, it is a separate room with space for all necessary supplies and equipment and work space for the children. However, it may be as small as a corner of the classroom and may contain only a few tools and supplies. Since the benefits of real problem solving can be obtained by the students only if they have a means to follow up their ideas, the availability of a Design Lab can be a very important asset.

Optimally, the operation of the school's Design Lab should be such as to make it available to the students whenever they need it. It should be as free as possible from set scheduling or programming. The students use the Design Lab to try out their own ideas and/or to design, construct, test, and improve many devices initiated by their responses to the USMES challenges. While this optimum operation of the Design Lab may not always be possible due to various limitations, "hands-on" activities may take place in the classroom even though a Design Lab may not be available. (A detailed discussion of the Design Lab can be found in Chapter VI of the USMES Guide, while a complete list of "How To" Cards covering such Design Lab skills as sawing, gluing, nailing, soldering, is contained in Chapter IX.)

Work on all USMES challenges is not only sufficiently complex to require the collaboration of the whole class but also diverse enough to enable each student to contribute according to his/her interest and ability. However, it should be noted that if fewer than ten to twelve students from the class are carrying out the investigation of a unit challenge, the extent of their discovery and learning can be expected to be less than if more members of the class are involved. While it is possible for a class to work on two related units at the same time, in many classes the students progress better with just one.

The amount of time spent each week working on an USMES challenge is crucial to a successful resolution of the problem. Each challenge is designed so that the various investigations will take from thirty to forty-five hours, depending on the age of the children, before some solution to the problem is found and some action is taken on the results of the investigations. Unless sessions are held at least two or three times a week, it is difficult for the children to maintain their interest and momentum and to become involved intensively with the challenge. The length of each session depends upon the age level of the children and the nature of the challenge. For example, children in the primary grades may proceed better by working on the challenge more frequently for shorter periods of time, perhaps fifteen to twenty minutes, while older children may proceed better by working less frequently for much longer periods of time.

Student interest and the overall accomplishments of the class in finding and implementing solutions to the challenge indicate when the class's general participation in unit activities should end. (Premature discontinuance of work on a specific challenge is often due more to waning interest on the part of the teacher than to that of the students.) However, some students may continue work on a voluntary basis on one problem, while the others begin to identify possible approaches to another USMES challenge.

Importance of the Challenge

Although individual (or group) discovery and student initiation of investigations is the process in USMES units, this does not imply the constant encouragement of random activity. Random activity has an important place in children's learning, and opportunities for it should be made available at various times. During USMES activities, however, it is believed that children learn to solve real problems only when their efforts are focused on finding some solution to the real and practical problem presented in the USMES challenge. It has been found that students are motivated to overcome many difficulties and frustrations in their efforts to achieve the goal of effecting some change or at least of providing some useful information to others. Because the children's commitment to finding a solution to the challenge is one of the keys to successful USMES work, it is extremely important that the challenge be introduced so that it is accepted by the class as an important problem to which they are willing to devote a considerable amount of time.

The challenge not only motivates the children by stating the problem but also provides them with a criterion for judging their results. This criterion--if it works, it's right (or if it helps us find an answer to our problem, it's a good thing to do)--gives the children's ideas and results a meaning within the context of their goal. Many teachers have found this concept to be a valuable strategy that not only allows the teacher to respond positively to all of the children's ideas but also helps the children themselves to judge the value of their efforts.

of the Teacher

With all of the above in mind, it can be said that the teacher's responsibility in the USMES strategy for open classroom activities is as follows:

1. Introduce the challenge in a meaningful way that not only allows the children to relate it to their particular situation but also opens up various avenues of approach.

2. Act as a coordinator and collaborator. Assist, not direct, individuals or groups of students as they investigate different aspects of the problem.

3. Hold USMES sessions at least two or three times a week so that the children have a chance to become involved in the challenge and carry out comprehensive investigations.

4. Provide the tools and supplies necessary for initial hands-on work in the classroom or make arrangements for the children to work in the Design Lab.

5. Be patient in letting the children make their own mistakes and find their own way. Offer assistance or point out sources of help for specific information (such as the "How To" Cards) only when the children become frustrated in their approach to the problem. Conduct skill sessions as necessary.

6. Provide frequent opportunities for group reports and student exchanges of ideas in class discussions. In most cases, students will, by their own critical examination of the procedures they have used, improve or set new directions in their investigations.

7. If necessary, ask appropriate questions to stimulate the students' thinking so that they will make more extensive and comprehensive investigations or analyses of their data.

8. Make sure that a sufficient number of students (usually ten to twelve) are working on the challenge so that activities do not become fragmented or stall.

Student success in USMES unit activities is indicated by the progress they make in finding some solution to the challenge, not by following a particular line of investigation nor by obtaining specified results. The teacher's role in the USMES strategy is to provide a classroom atmosphere in which all students can, in their own way, search out some solution to the challenge.

USMES in the Total School Program

Today many leading educators feel that real problem solving (under different names) is an important skill to be learned. In this mode of learning particular emphasis is placed on developing skills to deal with real problems rather than the skills needed to obtain "correct" answers to contrived problems. Because of this and because of the interdisciplinary nature of both the problems and the resultant investigations, USMES is ideal for use as an important part of the elementary school program. Much of the time normally spent in the class on the traditional approaches to math, science, social science, and language arts skills can be safely assigned to USMES activities. In fact, as much as one-fourth to one-third of the total school program might be allotted to work on USMES challenges. Teachers who have worked with USMES for several years have each succeeding year successfully assigned to USMES activities the learning of a greater number of traditional skills. In addition, reports have indicated that students retain for a long time the skills and concepts learned and practiced during USMES activities. Therefore, the time normally spent in reinforcing required skills can be greatly reduced if these skills are learned and practiced in the context of real problem solving.

Because real problem-solving activities cannot possibly cover all the skills and concepts in the major subject areas, other curricula as well as other learning modes (such as "lecture method," "individual study topics," or programmed instruction) need to be used in conjunction with USMES in an optimal education program. However, the other instruction will be enhanced by the skills, motivation, and understanding provided by real problem solving, and, in some cases, work on an USMES challenge provides the context within which the skills and concepts of the major subject areas find application.

In order for real problem solving taught by USMES to have an optimal value in the school program, class time should be apportioned with reason and forethought, and the sequence of challenges investigated by students during their years in elementary school should involve them in a variety of skills and processes. Because all activities are initiated by students in response to the challenge, it is impossible to state unequivocally which activities will take place. However, it is possible to use the documentation of activities that have taken place in USMES trial classes to schedule instruction on the specific skills and processes required by the school system. Teachers can postpone the traditional way of teaching the skills that might come up in work on an USMES challenge until later in the year. At that time students can learn the required skills in the usual way if they have not already learned them during their USMES activities.

These basic skills, processes, and areas of study are listed in charts and lists contained in each Teacher Resource Book. A teacher can use these charts to decide on an overall allocation of class time between USMES and traditional learning in the major subject disciplines. Examples of individual skills and processes are also given so that the teacher can see beforehand which skills a student may encounter during the course of his investigations. These charts and lists may be found in section E.

Ways In Which USMES Differs From Other Curricula

As the foregoing indicates, USMES differs significantly from other curricula. Real problem solving develops the problem-solving ability of students and does it in a way (learning-by-doing) that leads to a full understanding of the process. Because of the following differences, some teacher preparation is necessary. Some teachers may have been introduced by other projects to several of the following new developments in education, but few teachers have integrated all of them into the new style of teaching and learning that real problem solving involves.

1. New Area of Learning--Real problem solving is a new area of learning, not just a new approach or a new content within an already-defined subject area. Although many subject-matter curricula

include something called problem solving, much of this problem solving involves contrived problems or fragments of a whole situation and does not require the cognitive skills needed for the investigation of real and practical problems. Learning the cognitive strategy required for real problem solving is different from other kinds of learning.

3. Interdisciplinary Education--Real problem solving integrates the disciplines in a natural way; there is no need to impose a multi-disciplinary structure. Solving real and practical problems requires the application of skills, concepts, and processes from many disciplines. The number and range of disciplines are unrestricted and the importance of each is demonstrated in working toward the solution of practical problems.

3. Student Planning--To learn the process of problem solving, the students themselves, not the teacher, must analyze the problem, choose the variables that should be investigated, search out the facts, and judge the correctness of the hypotheses and conclusions. In real problem-solving activities the teacher acts as a coördinator and collaborator, not as an authoritative source of answers.

4. Learning-by-Doing--Learning-by-doing, or discovery learning as it is sometimes called, comes about naturally in real problem solving since the problems tackled by each class have unique aspects; for example, different lunchrooms or pedestrian crossings have different problems associated with them and, consequently, unique solutions. The challenge, as defined in each situation, provides the focus for the children's hands-on learning experiences, such as collecting real data; constructing measuring instruments, scale models, test equipment, etc.; trying their suggested improvements; and (in some units) preparing reports and presentations of their findings for the proper authorities.

5. Learning Skills and Concepts as Needed--Skills and concepts are learned in real problem solving

as the need for them arises in the context of the work being done, rather than having a situation imposed by the teacher or the textbook being used. Teachers may direct this learning when the need for it arises, or students may search out information themselves from resources provided.

6. Group Work--Progress toward a solution to a real problem usually requires the efforts of groups of students, not just individual students working alone. Although some work may be done individually, the total group effort provides good opportunities for division of labor and exchange of ideas among the groups and individuals. The grouping is flexible and changes in order to meet the needs of the different stages of investigation.

7. Student Choice--Real problem solving offers classes the opportunity to work on problems that are real to them, not just to the adults who prepare the curriculum. In addition, students may choose to investigate particular aspects of the problem according to their interest. The variety of activities ensuing from the challenge allows each student to make some contribution towards the solution of the problem according to his or her ability and to learn specific skills at a time when he or she is ready for that particular intellectual structure.

B. General Papers on Mass Communications

1. OVERVIEW OF ACTIVITIES

Challenge:

Find a good way for us to tell many people about ______________________ (topic, problem).

Possible Class Challenges:

Inform people at school and in the community about the problems of vandalism.

How can we tell other students about playground safety?

Find the most effective mass communications method to teach the metric system to everyone in the school.

The Mass Communications challenge may be introduced when the students have a need to tell other people about a specific topic or problem. In some classes the need may be identified during a class discussion relating to a particular incident at school (e.g., an accident on the playground) or to a specific area of study (e.g., the metric system) about which the students would like to inform many people. In other classes another USMES unit may lead to the Mass Communications challenge, for example, Orientation, if the students decide to expand their activities or orienting new students to include keeping the entire school informed about school events and news.

After the intended audience (another class, the PTA, the school, the local community) has been identified, the students discuss ways they can communicate with these people quickly and effectively. In some classes the children may divide into three or four groups, each working on a particular task necessary for the use of one medium. In other classes the groups may be able to work with different media, choosing, for example, among photos, filmstrip, videotape, newspaper, live skit, tape recordings, announcements, posters, flyers, or booklets. They may first decide to examine commercial presentations on television and radio, in newspapers and magazines, and on billboards to analyze characteristics of successful communications, for example, colorful photographs and drawings and distinct speech in announcements.

The students then explore the technical aspects of using the media, such as how to take and develop a good photograph, and they lay out an overall strategy for making effective presentations to their audience. In planning their presentations, the groups consider the relationship between the size of the audience and the type of medium used. Periodic class discussions are held during which the groups report on their progress. They also evaluate one another's work and make suggestions for any needed changes in the presentation, additional information required, new groups needed, etc.

After the presentations have been made, the students may conduct a survey of their audience to determine the effectiveness of the medium or media used. Results can be displayed on bar graphs, and if several media have been used, their relative effectiveness can be determined. If only one medium has been used, the students may decide to try another medium on the same or a different problem.

Although many of these activities may require skills and concepts new to the children, there is no need for preliminary work on these skills and concepts because the children can learn them when the need arises. In fact, children learn more quickly and easily when they see a need to learn. Consider counting: whereas children usually count by rote, they can, through USMES, gain a better understanding of counting by learning or practicing it within real contexts. In working on Mass Communications, children also learn and practice graphing, measuring, working with decimals, and dividing. Although dividing seems necessary to compare fractions or ratios, primary children can make comparisons graphically or by subtracting medians (half-way values). Division may be introduced during calculation of percentages, averages, or costs per unit.

2. CLASSROOM STRATEGY FOR MASS COMMUNICATIONS

The Mass Communications unit is centered on a challenge--a statement that says, "Solve this problem." Its success or failure in the classroom depends largely on (1) the relevance of the problem for the students and (2) the process by which they define and accept the challenge. If the children see the problem as a real one, they will be committed to finding a solution; they will have a focus and purpose for their activities. If the students do not think the problem affects them, their attempts at finding solutions will likely be disjointed and cursory.

The Mass Communications challenge--"Find a good way for us to tell many people about (topic, problem)."--can be worded to apply to many situations. Students in different classes define and word the challenge to fit the particular problems of their school and thus arrive at a specific class challenge. For example, students who are concerned about the large number of injuries on the playground might state their class challenge in terms of finding effective ways to communicate with their schoolmates about playground safety.

The Process of Introducing the Challenge

Given that a problem exists, how can a teacher, without being directive, help the students identify the challenge that they will work on as a group? There is no set method because of variations among teachers, classes, and schools and among the USMES units themselves. However, USMES teachers have found that certain general techniques in introducing the challenge are helpful.

One such technique is to turn a discussion of some recent event towards a Mass Communications challenge. The problem may concern only the school or it may be a topic of interest to the community as well.

> *A second-grade class used the Mass Communications unit to conduct a campaign promoting school pride. They became involved in the unit when the teacher read a note from the principal asking students to refrain from writing on the walls in the bathrooms. One girl in the class had also complained about the writing on the outside walls of the school. The students decided to use posters, a storyboard with photographs, public address announcements, notes to the classrooms, and a tape-recorded message to tell other students what things they liked and didn't like to happen at school (e.g., don't throw rocks at the school; do work nicely in the classroom).*

> *A class of sixth graders had recently read newspaper articles and watched television programs dealing with many incidents of vandalism in the local community. Just after they had started a school wide poster campaign against vandalism, two of the classrooms were vandalized at night. The problem became increasingly relevant, and the students decided to carry their message to the local community by getting in touch and working with local authorities and other schools.*

A Mass Communications challenge may arise from the children's work on another USMES unit, such as Advertising, Ways to Learn, or Orientation. For example, students working on an Orientation challenge may decide to expand their activities of orienting new students to school to include keeping the entire school informed about school events and news.

When children working on another USMES challenge encounter a problem that leads to a Mass Communications challenge, one group of children may begin work on this second challenge while another continues on the first. However, there should be at least ten or twelve students working on any one challenge; otherwise the children's work may be fragmented or superficial or may break down completely.

The Mass Communications challenge may also evolve during a discussion of a specific topic being studied by the class. For example, students learning about the metric system or energy conservation may become interested in relaying the information to others.

> *While one eighth-grade class was studying the metric system, they decided they would like to share their knowledge with seventh graders. The class devised presentations about the metric system by producing their own posters, slides, overhead projector transparencies, 8mm film, printed materials, and skits. To evaluate the effectiveness of their different communications methods, the eighth-grade students first administered a pretest to their audiences and later after the three-day teaching period, a posttest. One group of students became so interested that they wrote, dittoed, and distributed to parents and other students a six-page metric newsletter containing cartoons, limericks, recipes, puzzles, and a "Dear Mental Meter" column.*

Sometimes the discussion of a broad problem may encompass the challenges of several related units. For example, a discussion of problems in the school could lead to Eating in School, Classroom Management, Classroom Design, School Rules, Getting There, or Mass Communications, depending on which problems the children identify.

> *After discussing various problems at school, one sixth-grade class focused on using mass communications to show the need for a walkway between the main school building and the portable classrooms. Most students were using an angle footpath as a short cut; consequently, the grass was worn down and the students were carrying much dirt into the portable classrooms, especially when it rained. To communicate their plans to other students and to enlist their support, the class made posters,*

took and developed photographs, made several videotapes, and published a newsletter.

An experienced USMES teacher is usually willing to have the children work on any one of the several challenges that may arise during the discussion of a broad problem. While this approach gives the children the opportunity to select the challenge they are most interested in investigating, it does place on the teacher the additional responsibility of being prepared to act as a resource person for whichever challenge is chosen.

Classroom experience has shown that children's progress on a Mass Communications challenge may be poor if the teacher and students do not reach a common understanding of what the challenge is before beginning work on it. Having no shared focus for their work, the children will lack the motivation inherent in working together to solve a real problem. As a result, they may quickly lose interest.

In one intermediate class the teacher issued a very general challenge for the students to use mass media to communicate with other people. There were no prior class discussions of a particular problem or topic about which the children could see a need to tell other people. Subsequently, the class divided into three groups, each working on any topic they chose. After two months of work, only one group had carried out any of their plans. The other students had floundered in their activities, frequently changing topics. Because they had no real need to communicate with others, their interest and enthusiasm waned and the unit was discontinued.

A similar situation occurs if the teacher, rather than ensuring that the children have agreed upon a challenge, merely assigns a series of activities. Although the teacher may see how these activities relate to an overall goal, the children may not.

Initial Work on the Challenge

Once a class has decided to work on a Mass Communications challenge, USMES sessions should be held several times a week, but they need not be rigidly scheduled. When sessions are held after long intervals, students often have difficulty remembering exactly where they were in their investigations and their momentum diminished.

When the students have agreed that there is a real need to communicate with a large group of people, they often list approaches to solving their problems, including the various media they could use. Next they categorize their ideas, list the tasks necessary to carry out their plans, and set priorities for the tasks.

Often a class divides into smaller groups to prepare their media presentations. However, if too many groups are formed, work on the challenge can become fragmented, especially if the groups are using different media. The teacher finds it impossible to be aware of the progress and problems of each group; in addition, the small number of students in each group lessens the chance for varied input and interaction.

The problem of fragmentation can become critical in the Mass Communications unit if many small groups are using a variety of communications methods. Often children, particularly younger ones, have not had hands-on experience using media equipment and therefore need increased help from the teacher for supervision, skill sessions, and resource materials. This can result in greater competition for the teacher's time and attention and also in the possibility that some groups may become stalled and disinterested because of long waits for assistance.

> *One class of third and fourth graders listed twenty-one possible communications methods to use for their Mass Communications challenge and then chose nine: signs, videotape, intercom, photographs, books, 16mm film, tape recorder, and slide show. Each group contained only a few students who had little or no prior experience in producing media presentations. Because the teacher was unable to provide adequate attention for all the groups, the students encountered many problems, including wasted materials, broken equipment, decrease in interest, and frustration. Work became so fragmented and nonproductive that the challenge was eventually abandoned.*

Fewer groups investigating the techniques of using either the same medium or only two or three media will make the situation more manageable for the teacher and lessen the chance that some groups will become discouraged because of lack of direction.

Refocusing on the Challenge

As a class works on a Mass Communications challenge, the children's attention should, from time to time, be refocused on that challenge so that they do not lose sight of their overall goal. Teachers find it helpful to hold periodic class discussions that include group reports. Such sessions help the students review what they have accomplished what they still need to do in order to complete their investigations. Without these discussions, there is a strong possibility that the children's efforts will overlap unnecessarily. These sessions also provide an opportunity for students to evaluate their own work and to exchange ideas with their classmates.

One intermediate-level teacher allowed the students to divide into groups to work on different media presentations and thereafter neglected to call everyone together for class discussions or evaluations. The teacher was frustrated and disappointed that the quality of work in some groups was far below what she had expected; yet she felt she shouldn't be the class critic nor always offer suggestions. These difficulties could perhaps have been avoided had the entire class met for frequent, short discussions in which each group reported on its progress and the other students had an opportunity to critique the work and make suggestions for improvements.

Resources for Work on the Challenge

During the course of an USMES unit, a teacher may feel that the children are taking a wrong approach, and he or she is faced with the question: Should I interfere? If the teacher feels that the direction in which the children are leading is legally or morally unsound, he or she has the option to intervene. For instance, if children working on a Mass Communications challenge decide to videotape, photograph, or tape record an activity to find out which students are misbehaving or if they decide to publicize the names of children who have broken rules, a teacher might be inclined to forbid such activities. However, before the teacher steps in, the children themselves might question the fairness of their plans.

As one class of sixth graders developed a media campaign against vandalism, the P.A. Announcement

Group met to discuss the content of their messages. One boy wanted to broadcast the names of suspected vandals, but the other group members voted down his idea, fearing that it might do more harm than good. Later when class representatives were preparing a presentation for the School Committee, the students suggested certain things that might be avoided. For example, names of suspected vandals should not be used because, without proof, this would be a very serious charge.

If the children do not recognize a moral or legal conflict on their own, the teacher might ask questions that stimulate the children to think about their values and sense of responsibility to others. For example, a teacher might ask the children how they would feel if another class had the power to record their behavior on film and to evaluate their actions or to publicize accusations that they were guilty of misconduct.

The technique of asking open-ended questions is also useful when children encounter other difficulties during their Mass Communications investigations or try to decide on solutions before collecting enough data. These questions stimulate the children to think more comprehensively and creatively about their work. For example, instead of telling the children that the lettering on their posters is too small, the teacher might ask, "What improvements can you make on your poster?" or "How do you think other people will view your poster?" Examples of other nondirective, thought-provoking questions are given at the end of this section.

The teacher may also refer to the "How To" Cards relating to Mass Communications for information about specific skills, such as using a stopwatch or drawing graphs. If many students or even the entire class need help in particular areas, such as taking a survey or finding averages, teachers should conduct skill sessions as these needs arise. (Background Papers on topics relating to Mass Communications activities may be helpful.)

USMES teachers can also assist students by making it possible for them to carry out tasks involving hands-on activities. Media equipment can usually be borrowed from the school or district audiovisual department, and sometimes the children may bring materials from home. A teacher who is unfamiliar with certain media techniques can sometimes learn them before a class begins using the equipment. The children may also get in touch with resource personnel from the audiovisual department or lobbyists who could conduct skill sessions on using particular media.

If the children's tasks require them to construct items, such as stage scenery or props, the teacher should make sure that they have access to a Design Lab--any collection of tools and materials kept in a central location (in part of the classroom, on a portable cart, or in a separate room). A more detailed description of the Design Lab may be found in the USMES Guide.

Valuable as it is, a Design Lab is not necessary to begin work in Mass Communications. The Design Lab is used only when needed, and, depending on the investigations chosen by the children, the need may not arise at all.

One class of eighth-grade students worked successfully on the Mass Communications challenge without the use of a Design Lab. To introduce seventh graders to the metric system, the students devised a slide show, an 8mm film, a live skit, posters, and a learning packet consisting of dittoed materials. They completed all their preparations in the classroom or outside school and then assessed which method had been most successful in relaying information about the metric system.

To carry out construction activities in schools without Design Labs, students may scrounge or borrow tools and supplies from parents, local businesses, or other members of the community. The extent to which any Design Lab is used varies with different classes because the children themselves determine the direction of the Mass Communications investigations.

Culminating Activities

Student investigations on Mass Communications generally continue until the children feel that they have effectively communicated their message to other people. If the class has concentrated on using one medium, they may wish to explore other media for communicating their message. The students may decide to conduct an opinion survey of their audience to determine which medium was preferred or best relayed their message. If the class's message is intended to effect a change in the behavior of the audience, the students might investigate ways to determine whether a change actually occurs; for example, observing audience behavior after presentations or administering a posttest and graphing the results.

3. USE OF MASS COMMUNICATIONS IN THE PRIMARY GRADES

Because young children are naturally egocentric, the topic or problem they choose to communicate usually deals directly with their own day-to-day concerns. Thus, the scope of their message tends to be smaller than that of older students and, consequently, the size of their intended audience may also be smaller, usually consisting of their schoolmates and their families. For example, several primary classes have concentrated on telling other students about school situations such as playground rules, writing on walls, and littering. One combination class of second and third graders worked on a Mass Communications challenge to tell other people at school how their community looked in 1776.

After deciding to communicate a particular message, children often work in several smaller groups to develop their presentations. Some of the communications methods frequently used in primary classes include crayon pictures, posters, signs, storyboards, notes, tape-recorded messages, intercom announcements, and original skits. Most teachers find that fragmentation of activities can be avoided if primary children work on only one or two presentations at a time. When these are completed, the class can then work on additional presentations.

Although lacking technical expertise, primary children can learn to operate some of the simple, almost unbreakable media equipment that are now available (see bibliography). However, teachers, audiovisual personnel, or older students can also assist primary children by operating the more sophisticated equipment for them if the need should arise. They could, for example, videotape the children's play, operate a movie camera, or have a newsletter typed. In one second-grade class the students decided to make a storyboard using photographs. The children discussed and then drew sketches of how they wanted each photograph to be set up. Then they selected class members to pose for each scene and the teacher used her own camera to take the photographs.

As the children begin to develop their presentations, they will encounter many opportunities to learn and practice counting skills. The activity may be as simple as counting the number of posters needed to display in certain locations or counting the number of classrooms to find out how many notes to write. Tallying may also be introduced as a shorter way to keep track of many numbers. If the computation is very complicated, the students can seek outside help. One class of second graders realized that they did not know how to add the long columns of numbers to find the total tally for their survey. Therefore, they invited older brothers and sisters to come to their classroom to help with the addition. The children also used an adding machine and a hand calculator to check the figures.

Graphing skills may be taught as an easy way for the children to see and compare data. Graphs made with blocks or pegboards are especially useful in helping children to visualize graphic constructions. One second-grade class was especially eager to learn to make bar graphs so that they could display their survey data in an easily readable manner for an older class that had requested their survey results.

If the primary class wants to find an "average" (e.g., an average number of students per classroom), the children can find the median number which is better and easier to find than the mean, or average. Then they simply order the data from smallest to largest and count to find the middle number. To compare ratios or percentages, primary children can make slope diagrams and compare the steepness of the several lines on the diagrams. For example, the children might compare the cost per sheet of various types of paper.

Primary children may take many kinds of measurements while working on a Mass Communications challenge. They may, for example, learn to use a stopwatch to time the length of their oral announcements. This activity adds a new dimension to the standard lesson of telling time from clocks. The children may also use nonstandard units, such as lengths of string or "finger lengths," to make simple approximations of distance. Then, when they see a need for standard units of measure, they can learn to use the more common measuring tools. First graders in one class were very concerned that the alphabet letters they were making for a persentation be the same size. As they had had no experience using rulers, the teacher gave a skill session and explained how to use the one-inch markings. The children practiced measuring different objects before they decided to make their letters eight inches square.

The Mass Communications unit provides many opportunities for primary children to develop their language arts skills. They may devise and administer opinion surveys to find out other people's preferences for a particular medium or to evaluate the popularity of their several campaigns. Because they want other people to listen to or to read their messages, primary children will try to speak and write very clearly. One second-grade class worked diligently to maintain good spacing between their letters on their safety posters. Second graders in another class carefully checked one another's writing for the notes and letters they wrote to other classes. The teacher was very pleased with their efforts and observed that their writing was the neatest it had been in a long time. One first-grade class decided that the best way to make multiple copies of their letter would be to ditto it. Their teacher gave several students brief instructions about writing on a ditto master and then allowed them to experiment with several sheets before making a final copy. The children quickly realized that neatness and correct spelling were essential since the ditto could not be erased.

Artistic endeavors can be a major part of a Mass Communications challenge. Primary children are usually eager to display their artist talent and to use their imaginations in making creative designs. One class of second-graders spent several weeks evaluating and improving their drawings showing unsafe use of playground equipment until they were sure that other people would easily see their messages.

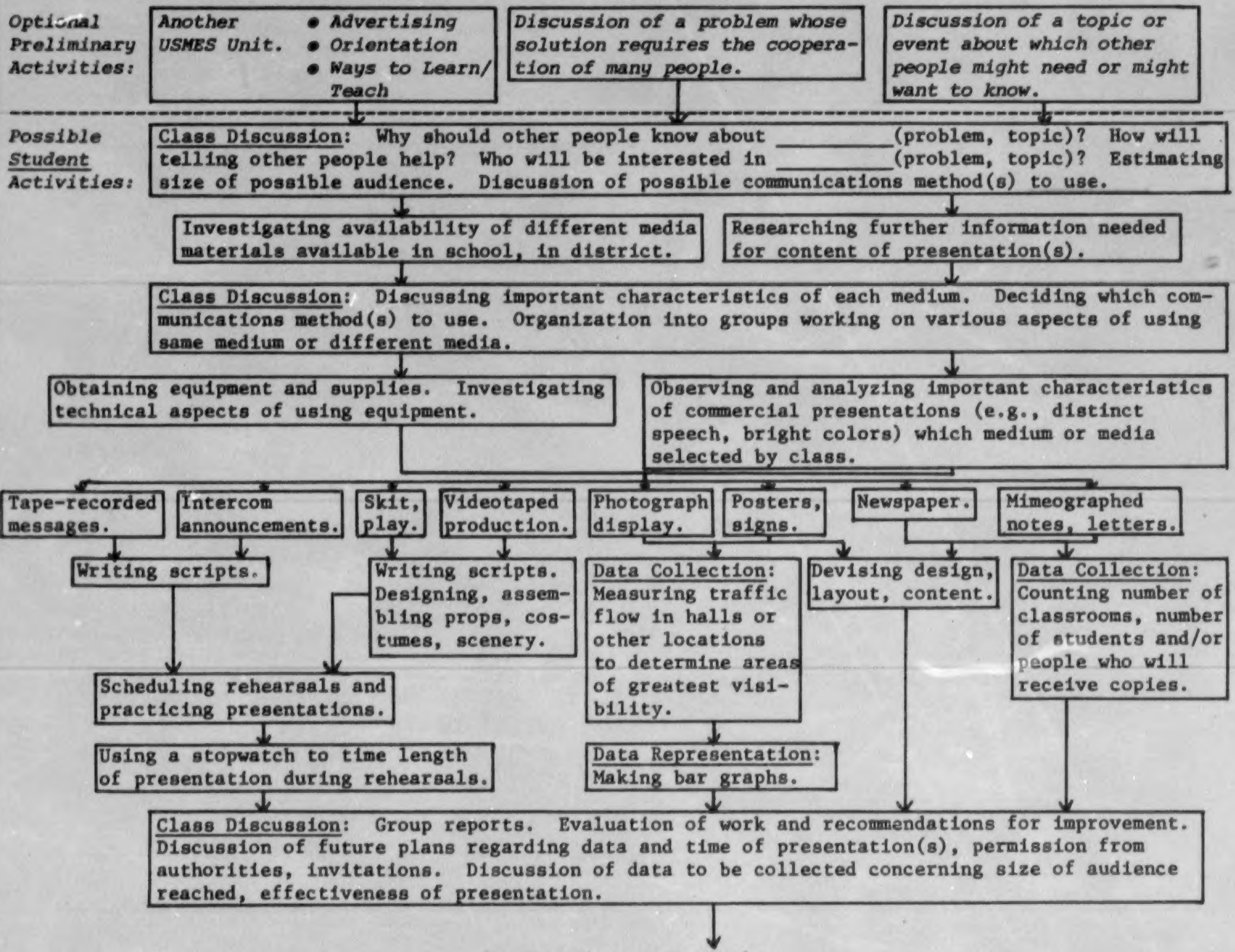
Primary children may also be involved in construction activities, depending on what is needed for their presentations. In one class of second and third graders, a parent helped a group design a scale model for a booth they needed to build and a high school student helped another group make a relief map. Primary children are usually enthusiastic about working in a Design Lab, and with adult supervision, they are able to use power tools without difficulty. For example, the first graders who needed large alphabet letters carefully made patterns on paper, and then spent four sessions marking the Tri-Wall and cutting out the letters with saber saws.

4. FLOW CHART

The following flow chart presents some of the student activities—discussions, observations, calculations, constructions—that may occur during work on the Mass Communications challenge. Because each class will choose its own approach to the challenge, the sequences of events given here represent only a few of the many possible variations. Furthermore, no one class is expected to undertake all the activities listed.

The flow chart is not a lesson plan and should not be used as one. Instead, it illustrates how comprehensive investigations evolve from the students' discussion of a Mass Communications problem.

Challenge: Find a good way for us to tell many people about _________(problem, topic).



Optional Preliminary Activities:

Another USMES Unit.
- *Advertising*
- *Orientation*
- *Ways to Learn/Teach*

Discussion of a problem whose solution requires the cooperation of many people.

Discussion of a topic or event about which other people might need or might want to know.

Possible Student Activities:

Class Discussion: Why should other people know about __________(problem, topic)? How will telling other people help? Who will be interested in __________(problem, topic)? Estimating size of possible audience. Discussion of possible communications method(s) to use.

Investigating availability of different media materials available in school, in district.

Researching further information needed for content of presentation(s).

Class Discussion: Discussing important characteristics of each medium. Deciding which communications method(s) to use. Organization into groups working on various aspects of using same medium or different media.

Obtaining equipment and supplies. Investigating technical aspects of using equipment.

Observing and analyzing important characteristics of commercial presentations (e.g., distinct speech, bright colors) which medium or media selected by class.

Tape-recorded messages.

Intercom announcements.

Skit, play.

Videotaped production.

Photograph display.

Posters, signs.

Newspaper.

Mimeographed notes, letters.

Writing scripts.

Writing scripts. Designing, assembling props, costumes, scenery.

Data Collection: Measuring traffic flow in halls or other locations to determine areas of greatest visibility.

Devising design, layout, content.

Data Collection: Counting number of classrooms, number of students and/or people who will receive copies.

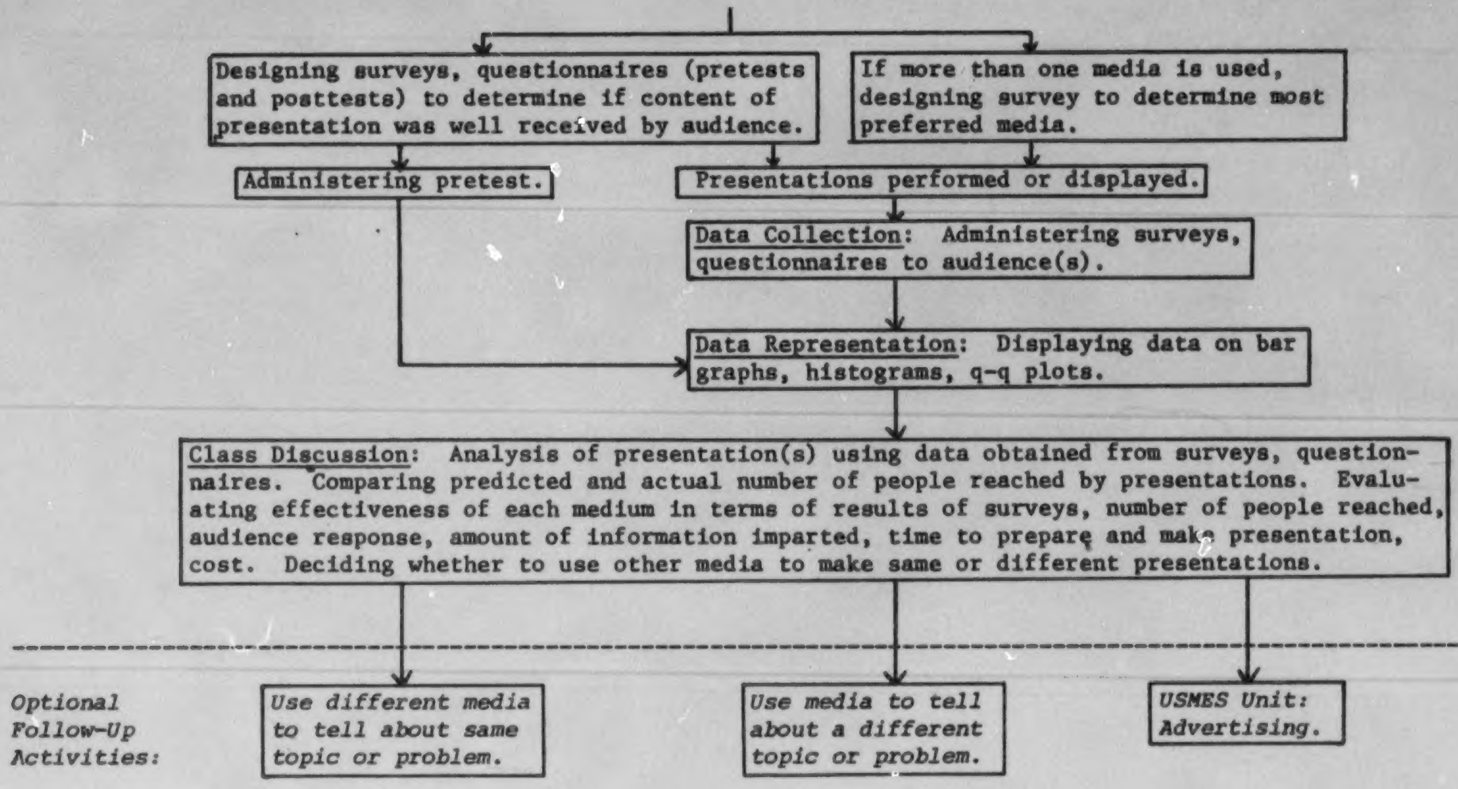
Scheduling rehearsals and practicing presentations.

Using a stopwatch to time length of presentation during rehearsals.

Data Representation: Making bar graphs.

Class Discussion: Group reports. Evaluation of work and recommendations for improvement. Discussion of future plans regarding data and time of presentation(s), permission from authorities, invitations. Discussion of data to be collected concerning size of audience reached, effectiveness of presentation.

(Continued on next page)



Designing surveys, questionnaires (pretests and posttests) to determine if content of presentation was well received by audience.

If more than one media is used, designing survey to determine most preferred media.

Administering pretest.

Presentations performed or displayed.

Data Collection: Administering surveys, questionnaires to audience(s).

Data Representation: Displaying data on bar graphs, histograms, q-q plots.

Class Discussion: Analysis of presentation(s) using data obtained from surveys, questionnaires. Comparing predicted and actual number of people reached by presentations. Evaluating effectiveness of each medium in terms of results of surveys, number of people reached, audience response, amount of information imparted, time to prepare and make presentation, cost. Deciding whether to use other media to make same or different presentations.

Optional Follow-Up Activities:

Use different media to tell about same topic or problem.

Use media to tell about a different topic or problem.

USMES Unit: Advertising.

5. A COMPOSITE LOG*

This hypothetical account of an intermediate-level class describes many of the activities and discussions mentioned in the flow charts. The composite log shows only one of the many progressions of events that might develop as a class investigates the Mass Communications challenge. Documented events from actual classes are italicized and set apart from the text.

Many of the students in a fifth-grade class participated in a local bike riding day during which bicyclists toured historic sites in the area. On the next school day the class discusses the event. Everyone participating enjoyed the tour, but there are several complaints. Besides disliking the slow pace set by the adults, some students complain about the motorists. One boy says that a car almost hit him, and several other students agree that they had been frightened by the motorists who didn't slow down and sometimes even opened car doors in the paths of oncoming bicyclists. One of the girls adds, "We should tell all those drivers what they're supposed to do. They don't even see us sometimes." The students agree that the carelessness of some motorists is a serious problem for bicyclists who ride on streets.

Another student comments that bicyclists are sometimes to blame for accidents, too, because they don't always obey the laws. He mentions riding through red lights as an example, and the class is soon involved in quite a debate.

Some students feel that it's all right to ignore traffic lights and signs if they look first to see that no cars are entering the intersection. One girl disagrees, saying that bicycles are just like cars and must obey the traffic signs and lights. The argument continues until the teacher asks, "How can you find out whether bicyclists and motorists must follow the same laws?" There is unanimous agreement that the police should be able to provide the information. Several students volunteer to stop by the police station after school to find out about the laws.

At the next session the students report on their visit. They learned that both bicycle riders and motorists are subject to the same laws of the road regarding driving on the right hand side, signaling for turns, yielding the right of way, obeying traffic signs and lights, and giving way to pedestrians. One student says, "That's good for us to know, but I'll bet the motorists and a lot of bicycle riders don't know about those laws."

The class discussion presents an ideal opportunity for the teacher to issue a Mass Communications challenge: "Find good ways for us to tell many people about traffic rules that affect bicyclists."

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*Written by USMES staff

> *The Mass Communications challenge arose naturally during a spontaneous discussion in a sixth-grade class in Monterey, California. The students were very upset that their game of flag football had been declared a tie. They were convinced that their team had been winning and they were anxious to prevent future errors in scorekeeping. Their teacher took advantage of the discussion and issued a challenge to find an accurate method for communicating team scores to participants and spectators at school games. After investigating various solutions, the class decided to construct a portable plywood scoreboard which prevented further confusion about team scores. (From log by Norma Lazzarini.)*

> *A combined class of third and fourth graders in Plainfield, New Jersey, received a special federal allocation from the Model Cities Agency to make six field trips during the latter part of the school year. When the children learned that they would be the only two classes in the entire school system to be given this opportunity, they realized that their trips would be very special. Because the students were eager to share their experiences with their schoolmates, the teacher issued the challenge, "How can we best share our field trips with the rest of the school?" On each trip the students took photographs, wrote notes, and sometimes asked the teacher to use the videotape to record some interesting sites. Later the class assembled a slide show and a "mini-museum" of their work and souvenirs which they presented to other students at school and to the Model Cities Committee. (From log by Diane Edwards.)*

The class then discusses which laws are most important for people to know. After considering various dangerous situations that may arise because either a mororist or a bicyclist breaks a law, the class chooses to concentrate on the following rules:

1. No bicycle riding on sidewalks.
2. Ride bicycles on the right side of the road with the flow of the traffic.

3. A bicyclist should obey all traffic signs and lights.
4. A bicyclist has the same rights of the road as a motorist.
5. Motorists: Watch for bicycles.
   Bicyclists: Watch for cars.

The next task is to decide which communications methods will reach a large audience both inside and outside the school. The students list on the board the following suggestions:

1. television
2. radio
3. newspaper
4. intercom
5. posters
6. flyers
7. film
8. slide/tape show
9. play

The students agree that some of the ideas could be combined, for example, videotaping a play for television. However, one of the boys comments, "We don't have any of the cameras or anything. How can we make a TV show?" Everyone agrees that he has made a valid point and that before deciding which methods to use, they should first investigate the availability of equipment and materials. The students who are especially interested in particular media agree to find out about sources from which they can obtain needed supplies.

Several days later the class meets to hear various reports. The principal has told one student that limited amounts of ditto paper and oaktag are available. Another student has found that the videotape equipment owned by the school district can be used by the class but must be operated by a trained adult. One girl adds that the sponsor of the school camera club will lend several cameras and other photo equipment. Another student reports that the assistant principal has agreed to loan his Super 8 movie camera and projector, provided that he can give instructions on its use. A local radio station was called by one student, but she was unsuccessful in reaching the station manager.

Since the students now have some idea of what type of equipment is available, they discuss each method in terms of how many people it might reach and how much attention it will attract. Finally, they vote on the listed suggestions and choose three methods: posters, flyers, film.

As the children are volunteering to work in the three groups, the teacher remarks, "Someone mentioned that we need to consider how much attention people pay to our methods. Is there any way we can find out if people really do notice what we're doing?"

The students offer suggestions, including asking people whether they notice the methods, asking bicyclists whether motorists improve their driving habits, and finding out whether the number of bicycle-automobile accidents declines. One girl adds that perhaps the class can ask people about the laws before and after their presentations to find out how well the messages have been communicated. Other students agree that her suggestion is good, and many children are curious to find out whether or not people are presently aware of the laws. Therefore, a fourth group is formed to be in charge of devising and conducting surveys to assess people's current knowledge of the laws.

> *In Athens, Georgia, an eighth-grade class devised various media presentations (skit, learning packets of dittoed materials, posters/games, slides/film, and a final group using a variety of media) to introduce seventh graders to the metric system. To assess the effectiveness of the different media the class designed and administered pretests and posttests. In analyzing the results, the students found that the most signigicant gains on the posttest had been made by those students who were presented a variety of media. (From log by Peggy Neal.)*

The children work in their groups for several weeks and also hold periodic class meetings to discuss the progress of each group and any problems or difficulties the children have encountered. The activities of each group are described in the following paragraphs.

Survey Group

At the first meeting of the Survey Group, the students decide that their questionnaires should be administered to motorists and to bicyclists ten years of age and older. They feel that younger bike riders might have difficulty understanding the questionnaire and that younger children often are not allowed to ride their bikes on streets. The group refers to the five rules selected by the class and discusses how they can ask questions to find out whether or not people are aware of the rules. After much discussion they agree that they and any of their classmates who wish to assist will conduct "on-the-street" interviews by reading a sentence and asking for a response of true or false. They reason that people will more likely take time to answer if the questions and answers are short and if they don't have to be bothered with writing anything.

> *While working on a campaign against vandalism, one group of sixth-grade students in Arlington, Massachusetts, conducted two sets of on-the-street interviews. To avoid taking up too much of the interviewees' time, the students asked the questions orally and briefly jotted down the responses. The second set of interviews was videotaped, and the children noticed a change in the people's behavior; many people deliberately avoided the camera by crossing the street or by saying that they had no time to answer questions. (See log by Bernard Walsh.)*

The children devise the following questions for their interview:

1. If the traffic is heavy, a bicyclist should ride on the sidewalk. T F
2. A bicyclist should come to a complete stop at a red light. T F
3. If a car and a bicycle are turning right at the same time, the car always has the right of way. T F
4. A bicycle rider has the same rights of the road as a motorist. T F
5. A bicycle rider should ride facing the traffic so he can see oncoming cars. T F

The group decides not to ask the name of the person being interviewed but to note whether the person is an adult or a student and whether the person uses an automobile or bicycle or both. They decide that people who use neither bicycles nor cars will not be surveyed since their knowledge of the rules would not be important for the survey results.

One child copies the questionnaire onto a ditto master and arranges to have copies made in the office. The students then spend several days conducting their survey both during and after school.

> *A sixth-grade class in Ocala, Florida, worked on a Mass Communications challenge to use media to encourage others to support the beautification of their school. The students decided to conduct a sample survey to determine which of five different types of pathways between the main building and portable classrooms was preferred by most students. The class first met to define their target population and then decided to do a sample survey of ten classrooms. They agreed that in each room they would distribute the survey to four students, then skip one, to four more students, then skip one, etc. Approximately twenty-four people in each class were thus randomly selected for the survey. (From log by Sue Willis.)*

When all the interviews have been completed, the entire class works together to compile the data. As they are discussing how to score the questionnaires, the students decide that they should mark the number of correct answers on each survey and then find the average score for each category--motorists, bicyclists, and those who use both cars and bikes.

After the surveys are marked, they are separated into the three categories, each distributed to a group of students who will be responsible for finding the average score. The teacher reviews the method for calculating averages and recommends that later the students will probably find it easier to compare the average scores of the three groups if they use decimals rather than fractions.

When the average scores are determined, the Survey Group agrees to display them on a bar graph. The class then analyzes the results and sees that bicyclists and people who use both autos and bikes scored better than motorists. Everyone agrees that this confirms their feeling that motorists need more education about the rights of bicyclists.

Someone mentions that it would be interesting to compare the scores from children in different grade levels. The Survey Group agrees to compile this data and later presents a bar graph showing the average scores for fourth, fifth, and sixth graders, junior and senior high students, and adult bicyclists. The class quickly sees that younger children scored lower than older children and adults. The students feel that their film will be most beneficial to younger bicyclists. Because the work of the Survey Group is temporarily completed, these children join other groups to help with the presentations.

Poster Group

The children in the Poster Group decide to display posters both at school and in community areas where many people congregate. While they are discussing the layout of the posters, a heated argument erupts. Some of the children want to borrow the camera equipment from the school camera club and use photographs to illustrate the rules. They point out that some children, especially younger ones, will not be able to read the posters. Other students feel that photos would be good, but because they have no money for film and developing costs, they should just write the rules and maybe draw some pictures. At this point the teacher suggests that before making a final decision, the group should investigate the expense involved in taking photographs.

Several students talk with the sponsor of the camera club who suggests that, if they're interested, they can save on expenses by actually developing and printing the photographs themselves. The children are indeed interested. The sponsor adds that cameras, a few rolls of film, developing chemicals, and print paper are available free from the club. Their only expense will be for approximately five additional rolls of film which the sponsor can order at 84¢ per sixteen-exposure roll.

These students report to their group and learn from another student that the Film Group plans to ask the PTA for money from the special projects fund. The Poster Group agrees that they will also submit a request for $4.20 to purchase film.

> *Students in the Ocala class decided to use photographs on posters as one method of communicating with their schoolmates. The eight students who formed the Photography Group were the first in the whole school of over 1,000 students to learn photography. The group obtained the principal's permission to clean up the old darkroom equipment which hadn't been used for over four years, and to set up a darkroom. They also had access to cameras but only*

> *limited money for supplies. They very carefully kept track of their expenses and decided to take, develop, and sell photographs of other students to raise money to cover their expenses. (From log by Sue Willis.)*

In the meantime, the group discusses how many posters they will need for different locations. The children agree that they should choose areas where many people frequently congregate and then ask permission to place posters there. Several students draw a rough plan of the school and designate areas with high density traffic, such as the school lobby, cafeteria, gym, central office, and main corridors.

> *A combined class of fifth and sixth graders in Burnsville, Minnesota, worked on a Mass Communications challenge to make people in their school more aware of the bicentennial. The students developed various displays for the school corridors including a five-foot by six-foot poster, bulletin boards, display case exhibits, a wall hanging, and many posters. Rather than placing their posters in many locations around school, the class decided on a gallery effect, choosing to place them all along one corridor which they called "Bicentennial Wall." (See log by Linda Anderson.)*

Other students begin listing local stores and public places, such as the city library, banks, recreation halls, and churches, where they hope to place posters. The group then divides the community areas and assigns students to find out whether they can place posters there.

> *The Arlington students conducted two poster campaigns in their school and then placed their posters in various areas of the community. One group of students interviewed ten local merchants and found that only two would not display the posters. The other sites selected by the class included areas where many people frequently congregated such as the public library, banks, churches, and recreation buildings. (See log by Bernard Walsh.)*

Several days later the group compiles their information about poster sites and finds that they will need forty-two posters. Of these, twelve are to be placed in the school. The children concur that for the school and for some other locations they can reuse oaktag which has one clean side because the back won't be visible.

Good news is received from the PTA--the film costs will be paid by a special projects fund. The students are eager to tell the camera club sponsor right away. She agrees to provide basic instruction in camera use as soon as they are ready to start taking pictures.

The group meets to discuss the content of their photographs. They feel that it would be good if they could get live-action shots, but they agree that they would have to wait too long for an appropriate time. They decide, instead, to have the students pose for the pictures and to ask adults to pose in their cars. Photographs showing people breaking rules will have a large X drawn through them.

One group of second graders in Lansing, Michigan, chose to make a photograph storyboard as one of their communications methods for telling other students what they did like and didn't like happening at school. The children first sketched the "Do" and "Don't" scenes and then posed for the pictures which the teacher took with a Polaroid camera. The students selected eight photographs which they mounted on heavy cardboard covered with aluminum foil, and they devised captions for each picture (e.g., "Do play nicely," "Don't fight.") (See log by Marie Marshall.)

The group refers to the list of rules and agrees to set up the following situations:

1. A bicyclist riding against the traffic
2. A bicyclist riding on the sidewalk
3. A bicyclist riding through a stop sign
4. A bicyclist and a motorist turning right at the same time
5. A bicyclist turning left while a motorist waits
6. A bicyclist and a motorist waiting for pedestrians to cross in a crosswalk

7. A motorist stopping at a yield sign while a bicyclist passes
8. A motorist opening a door in the path of an oncoming bicyclist

The students feel that these scenes will adequately cover the situations showing that a bicyclist and motorist must obey the same rules of the road and that each driver should watch out for the other. They agree that the forty-two posters don't need separate pictures since the same people won't be seeing all of them. The students decide to select the best picture to represent each rule and then to make several copies.

The camera club sponsor shows the children how to use the cameras and how to load and take out film. The children experiment by taking posed photos of each other on the playground. When all the group members have had the opportunity to take at least half a roll of film, they contact the Design Lab manager who has agreed to help them develop the film.

In the Design Lab the manager explains how to remove the film and place it inside a developing tank, using a black cloth bag as a mini-darkroom. Then he asks the children to fill one bucket with warm water and four buckets with water at room temperature. Since there are puzzled looks on the children's faces at the mention of room temperature, the manager explains that it means approximately 70°F. He provides a thermometer so that the children can test the water. They are all surprised that the water feels cooler than they would have thought. The manager says that three buckets with room-temperature water are used for rinsing and the other contains the fixing solution; the bucket with warm water contains the developing solution. So that the children can remember how long to keep the film in each bucket, the manager writes the time limits on a chalkboard:

1.	Rinse	1 minute	(room temperature)
2.	Develop	5 minutes	(warm)
3.	Rinse	1 minute	(room temperature)
4.	Fix	5 minutes	(room temperature)
5.	Rinse	1 minute	(room temperature)
6.	Hang on clothes line to dry.		

The children develop their negatives during this session and hang them up to dry.

Ocala students working on photography first viewed two filmstrips on how to use cameras and take good pictures, and group members arranged to have a college student also assist them. When they ran into problems with developing procedures, the students blindfolded each other to practice rolling film on the reel for the developing tank. The group also learned about degrees Fahrenheit and degrees Celsius and made a conversion graph to use in determining water temperature. When several sets of photos had been developed, the students presented them to the class for an evaluation. After a careful inspection, some pictures were accepted and others rejected, and the reasons were discussed. (From log by Sue Willis.)

The next day the Poster Group meets to see how their negatives came out. The manager explains how to use the Repro-Negative paper for making prints from one negative at a time. The children set up the negatives and paper in a sandwich glass (two pieces of thick glass which prevent the paper and negative from curling), expose them to the sunlight for only a second, and then rinse the paper in the developer until the image appears. Finally, the photo is rinsed in fixer, then in water, and dried with a paper towel.

The children are very excited when they see some of their own images start to appear in the photographs. Many of the pictures are blurred, a few are too dark, and several are double-exposed, but the students are, nevertheless, thrilled with their first attempts at photography. So that their next attempts will be better, the manager leads an evaluation discussion. The students examine each photo to determine what was done correctly and how improvements can be made.

The Poster Group shows the photos to the rest of the class during the next session, and many students volunteer to pose for any additional pictures. When the final photographs are taken, one of the mothers plays the part of the motorist, and the group members who have brought their bicycles to school take turns posing as the bicyclist.

Later the group develops their film in the Design Lab, and during a class meeting the best pictures are chosen to represent the rules. After school several students work in the darkroom with the camera club sponsor to enlarge the selected photographs to 4" x 5".

Before gluing the photos to the oaktag, several students meet briefly with members of another class, who, in working on Advertising, had tested various colors of posterboard to see which attracted the most attention. The Poster Group uses as many bright colors of oaktag as are available and under each picture includes a caption stating the rule. When all the posters have been completed, the group distributes them among the members who are responsible for placing them in the designated areas at school and in the community.

Flyer Group

The children in the Flyer Group first discuss the format of the flyers. They decide that, to attract attention, they will use large block letters across the top reading, "Motorists, Watch Out for Bicyclists." They consider using their alphabet stamp so that they can print with different colors, but they finally decide that it will be too time-consuming to print a large quantity of flyers by hand. When they ask the teacher for advice on how to ditto two colors on their flyers, they learn that they can write the heading on one color of ditto and then write the text on a different color ditto.

For composing their message, the group refers to the list of rules compiled by the class. At the bottom of the note, they include a brief explanation that the flyer has been written and distributed by a fifth-grade class concerned about the safety of bicyclists.

Quite a debate arises when the children discuss where and how they will distribute the flyers. One student wants to hand them out at school, but other children mention that this method won't reach many mororists. Someone else suggests placing them on car windshields at parking lots and shopping centers. There is immediate objection by several students who feel that people will not read them and that they will only litter the ground. Finally one boy proposes that the group deliver the flyers door-to-door to all the houses in town. He adds that in this way the flyers won't become litter and that they will reach both adults and children.

The other children agree that it would be a good way to distribute the flyers, but a few are uncertain whether there will be enough time for them to visit all the houses. The children decide to look at a city map to figure out how many streets they will need to cover, but even with the aid of the map, the children are unable to determine how many flyers they will need. One girl volunteers to call the

Town Hall and other students agree to investigate other possible sources of information.

At the next session the girl reports to the group that a clerk at the Town Hall said that the approximate number of houses could be found by dividing the latest census figure (14,713) by an average family size of four. The girl says that this number is 3678 or approximately 3700 houses. The children are surprised at the figure and at the quantity of paper they will need to distribute one flyer to each household.

The girl adds more information. She was referred to the Town Clerk's Office where she was told that if the class decides on door-to-door distribution, the flyers cannot contain controversial messages and cannot be placed in mailboxes without a canceled stamp. Also, the police department should be told about the distribution--who is handling it, on what days, and in what areas.

Some of the children feel discouraged at the prospect of trying to reach so many people. However, one of the students does some quick division and says that if each of the twenty-nine students in the class helps with the distribution, it will mean only about 125 houses per student. He adds that the students can work in pairs to cover both sides of a street and that in two or three days they can easily reach all the houses. He notes that on his paper route he delivers one-hundred newspapers every day and it usually takes him only about one and a half hours when he rides his bike. His argument convinces the others that it can be done.

Before they ask for assistance from other class members, the students agree that they should first find out whether the school will provide such a large quantity of paper. One child speaks with the principal, who says that although the students can use the ditto machine, because of the tight budget the school can provide only one ream of regular ditto paper. He offers eight reams of cheaper paper used for practice work in math, and the group is satisfied that this paper will serve their purpose.

The next task is to plan how the group will present their proposal to the class. Using a city map and a clear plastic overlay, they divide the city into fifteen approximately equal areas. They omit the business districts because there are so few houses and because they feel that people living there will probably see the other group's posters.

The plan is presented to the other students at a class meeting. One boy explains the details of the distribution and shows a sample flyer and the divided areas on the map.

After thorough discussion of the plan, the class agrees that the activity should have a worthwhile effect. The children choose partners and areas of the town for which they will be responsible.

The group next transfers their message to ditto masters, and the school secretaries give instructions on how to use the ditto machine. Because the quantity of flyers is so large, the children spend several sessions making the copies and sorting them into individual student stacks of 125 copies.

One girl checks at the police station to give final details about the distribution and to get official approval that their message is not controversial. With the permission granted, the group divides the flyers among the class and reminds everyone about his/her responsibility to complete the task.

The distribution is carried out over a three-day period, Friday afternoon and the weekend. On Monday the class meets to discuss their work. Four students have not completed their distribution, and the Flyer Group is angry with their lack of cooperation. The students promise to finish the job within the next few days.

Several children complain that their districts are too large and that they didn't have enough flyers. Others say that they have flyers left over. The group agrees to use the information from their classmates to finish the distribution themselves. In general, the class has enjoyed the work, and they relate their experiences meeting many of the people, most of whom had agreed to consider the rules and also to inform their children.

Film Group

The assistant principal has agreed to loan the Film Group his Super 8 camera and equipment and to help them learn to operate it. However, before actual shooting begins, the group meets for several sessions to decide on a general scheme for their film and to make a general script of scenes they want to shoot. They decide to take candid shots on the street and to follow a student's suggestion to film after school when many children are leaving on their bikes. To demonstrate the rules listed by the class, they feel that they will probably still need some posed scenes with class members playing the role of bicyclists.

Before they began actual videotaping, sixth-grade students in Boulder, Colorado, were taught the

> *storyboard technique. The teacher explained that this was a plan of the sequence of the story that would help them decide which scenes could be taken during the same shooting and which would need to be spliced adjacent to each other after the filming. (From log by John Limon.)*

> *One group of sixth-graders in Marina, California, developed a videotape presentation for third graders on the proper way to take care of teeth. They researched for additional information and also obtained on loan a model of oversized teeth on jaws that opened and closed. The viewers felt that it was an interesting presentation, especially the demonstration on the proper way to clean teeth, for which the girls used an eighteen-inch length of dental floss. (From log by Philip Dershem.)*

With a general format outlined, the group reviews their plans with the assistant principal. He says that although he has all the needed equipment--Super 8 camera and projector, editing viewer, and splicing kit--he does not have extra film. He estimates that they will probably need about five rolls of three-minute film so that they can practice shooting and then get enough footage to edit into a five-minute movie. He adds that they will also need to consider the cost of developing film.

Since they have not discussed funds for their production, the children are silent. One boy then suggests that they could have a money-making project to raise the money. The assistant principal reminds the group that this would be against the new school policy. He suggests that they could present an estimated cost to the new special projects committee of the PTA that has been established for such activities as theirs.

One student checks at a local photography shop and makes the following calculation:

5 rolls of 3-minute Super 8 color film (costs $3.40 each)	$17.00
Developing 5 rolls (costs $2.60 each)	13.00
	$30.00

The group submits to the PTA committee a letter explaining their plans and the projected cost. Several days later they receive approval to purchase the supplies.

The group again meets with the assistant principal who explains how to operate the camera. He says that each shot should be at least seven seconds long and that the children should stand with their feet approximately eighteen inches apart to steady themselves. Because there is only one camera, the children take turns using it for thirty seconds each.

> *A group of the students in Boulder learned to operate the VTR machine and camera with the teacher's assistance. Before beginning actual hands-on work, the teacher assigned TV viewing for homework. The students tallied all close-ups (CU), medium shots (MS), and long shots (LS) for a fifteen-minute segment of a favorite program. This activity helped the students realize that a TV (or videotape) production requires a great amount of planning and shooting. Later the teacher taught one student to thread the videotape, record from the TV monitor, and rewind and change the tape. The student then taught this process to a classmate. As each student learned the operation, he/she became the teacher of another person in the group. (From log by John Limon.)*

While the group is waiting for the film to be developed, the assistant principal begins to explain how to edit and splice film. The children practice on old film obtained from the district audiovisual department. Because the children are so involved in the techniques of filming, the assistant principal asks whether they have considered other things besides their scenes to include in the film. One girl mentions a title, and someone adds that they should make a sound track, too. The group agrees that these things are needed, but they decide to delay work on the sound track until they have the film in its final form.

The practice film is developed and arrives within a week. The group presents it to the entire class, and everyone enjoys the viewing. After the children discuss which scenes contained the clearest pictures, the two best camera operators are selected to be the cameramen. The entire class is invited to pose for a shot to be used in the credits.

The students begin shooting their candid shots at school dismissal time, and they are excited to film a motorist driving through a pedestrian crossing when student bicyclists are trying to cross. The rehearsed scenes are filmed with group members riding their bicycles and the assistant principal acting as the motorist. One of the boys develops a title design and a list of credits which are also photographed.

> *Children in a Salem, Virginia, class planned a Super 8 movie showing the various geometrical shapes (circle, square, rectangle, triangle) that were present in their everyday environment. Because some of their segments were introduced by signs announcing the shape that was to follow, the children found that they needed to know how much time the audience needed to read the words. To solve the problem, the children used a stopwatch to find the length of time it took several students to read the signs silently. They averaged the individual times, and while one child filmed, another used a stopwatch to tell the camera operator when to stop filming. (From log by Barbara Kurshan.)*

After waiting another week for the film to be processed, the group shows their raw footage to the entire class. Some of the scenes have turned out very well, and the students help select the best ones for the edited version. They time each good section and decide that the total time is slightly less than that needed to fill one five-minute reel.

The Film Group works with the assistant principal to cut the film into sections. The scenes they will use are taped to a wall and ordered according to their sequence in the film. Finally the pieces are spliced and the film editing is completed.

Again the group shows their work to the class and everyone seems pleased. Someone suggests that music be added to the introduction when the audiotape is made, and the Film Group agrees to consider this idea.

After timing the actual length of the film as four minutes, thirty-five seconds, the group begins to work on the script. They decide what message is needed to accompany the different scenes, and then they practice reading the first draft while the movie is shown. Revisions are made so that the words are better coordinated with the scenes. Two boys have worked outside class to write a parody of a rock song about motorcycles, changing the words to bicycles. The group likes the song, but the students feel that it would be better as an ending rather than as an introduction. They finally decide on a lively instrumental to use at the start of their film.

The children try recording their script with different students reading separate sections. However, when they listen to the results, they feel that handing the microphone back and forth causes too much background noise. They select one boy to be narrator for the entire script.

> *One group of second graders in the Lansing class decided to communicate by using a tape recorder. The students devised two lists, one for things they liked and one for things they didn't like happening at school. When they recorded, they took turns reading one item at a time, and later played their tape over the intercom so that all students would hear their message. (See log by Marie Marshall.)*

> *The sixth graders in Marina solved the problem of the excess noise from shuffling paper notes that interfered with their videotape recording. They printed their scripts on large sheets of butcher paper which were then held next to the video camera and used as "idiot cards." Thus, the students did not have to memorize a complete script and rather than looking down to read their lines, they were able to face the camera. (From log by Philip Dershem.)*

Another problem is encountered with the children try to synchronize the audiotape with the film. Even though they try to start both at the same time, they find that it is almost impossible to do so since people wind the leader tape at different lengths. They discuss various possible solutions, such as including in their film a sign that says, "Start tape here," or a beep on the recorder to indicate that the film should be started.

Several students in the Burnsville classes worked on an original slide/tape show to help primary students understand our nation's bicentennial celebration. They designed twenty-four drawings on acetate and wrote an accompanying narration which they recorded. To indicate a change of slides, they used a bell which rang so loudly they had to redo the tape with the bell on the other side of the room. (See log by Linda Anderson.)

The assistant principal makes a suggestion that solves their problem. The students place a crayon mark on the film where the sound should commence. The students add a brief instruction to the beginning of the audiotape: "When I say stop, stop the recorder and turn on the film. When you see the ink mark on the film, start the recorder again. Stop." When the students are convinced that they have found the correct synchronization, they replace the crayon mark with a horizontal ink scratch across the film.

The Film Group is quite pleased with their work. They give presentations to their own class and to other classes at school. At the next meeting of the PTA, the group shows their finished film so that the committee will see how the funds have been used. The other two groups also show examples of their posters and flyers.

The community reaction to the class's work is good. A reporter from the local newspaper comes to interview the students and to take photographs of their work.

To find out more information about vandalism in their community, the Arlington students invited guests from the police department, PTA, school committee, and Town Meeting to visit their class. Through their work with adults, the students were invited to send class representatives to make presentations of their activities to the school committee, the high school student council, and a town-wide conference on vandalism. The local newspaper also sent a reporter to interview the class. The students were very pleased to see that their activities comprised the major focus of two newspaper articles. (See log by Bernard Walsh.)

When the article is printed, the class begins to receive requests from several other organizations that wish to view the film. The children have already started to make presentations at several schools, and now they are invited to show the film at scout meetings, the local library, and the school board.

With the flyers distributed, the posters displayed, and the film presented, the class meets to discuss their final task. The Survey Group forms again to review the results of the first questionnaire. They explain that they will conduct a second set of on-the-street interviews to see whether their presentations have had an effect. One student suggests that they also add a question asking which methods--posters, flyers, or movies—were noticed.

The interviews are conducted and again the class works in groups to score the questionnaires and to compute the average score for each of the three categories. Members of the Survey Group depict the data from both questionnaires on a bar graph so that the two scores for each category can be more easily compared.

> *When the second graders in Lansing had presented their five communications methods (posters, photoboard, notes to classrooms, audiotape, and live intercom announcements), they conducted a survey to determine the most effective method. When the results from all classes were tallied, the teacher introduced the students to graphing as a clearer way to represent data. The children were very pleased when sixth graders used their survey results to help plan an advertising campaign. (See log by Marie Marshall.)*

During a class discussion the children agree that a greater awareness of the rules is reflected by an increase in the average scores. In reviewing the data, they notice that while all three groups showed some improvement, the motorists had increased their average score more than the other two groups.

After some discussion of how to handle the data on the effectiveness of the three campaigns--posters, flyers, and film--the students decide to tally the number of people who were reached by each method. Later the class complies the following data on the board.

posters	motorists	56
	bicyclists	72
	auto/bike	61
	total	189
flyers	motorists	108
	bicyclists	85
	auto/bike	92
	total	285
film	motorists	24
	bicyclists	93
	auto/bike	31
	total	148

The children see that their flyers reached a larger audience than the posters or the film. They note that more bicyclists saw the film than any other method. The children reason that this is because most bicyclists interviewed were students who had seen the film at school; most adults had not had an opportunity to view the film.

At the following meeting of the PTA, the class presents their graphs and charts to show that there has been a general overall increase in the awareness of bicyclists and motorists regarding the laws affecting bicycle riders.

6. QUESTIONS TO STIMULATE FURTHER INVESTIGATION AND ANALYSIS

- Why is it important to tell many people about __________ (topic, problem)?
- Who is your intended audience?...other classes?...the school?...other schools?...the community?...a select group of people within the school or community?

- Why should other people be interested in your message? (e.g., education, information, entertainment).
- How can you reach a large number of people in a short time?
- What are the different forms of mass communications you can use?
- How large an audience can you reach with each medium?
- Which medium do you want to try first?
- Where could you find information about techniques for using media (videotape, tape recorder, camera, ditto machine, slides, etc.)?
- What can you learn from looking at or listening to commercial presentations (e.g., TV, radio, newspaper, magazines, billboards) that you might want to include in your presentation?
- How can you figure out the best sizes of lettering, best colors, etc., to use on your posters, newspaper, display board?
- What relationship does the size of the audience have to the size of posters, photographs, display?...to the loudness of announcements, tape recordings, speeches?
- How can you determine the costs of using different media? Can you compare the costs of using different media to the number of people reached by each?
- Where do you think the posters or signs should be placed? How can you determine the best locations?
- How can you figure out how many posters, newsletters, flyers, etc., you will need?
- How can you make pictures of your data on colors, size of lettering, etc.?
- How can you show your survey data more clearly? What kinds of graphs can you make?
- What improvements can you make in your presentations?

- When is the best time of day to make your presentation?
- What can you tell other people to expect about the length of your presentations?
- How can you determine if your messages are effectively reaching the intended audience?
- How can you find out which medium was the most effective in conveying the message?
- If the presentation is designed to produce a change in the behavior of the audience, how can you determine if that change has occurred?

C. Documentation

1. LOG ON MASS COMMUNICATIONS

by Marie Marshall*
Allen Street School, Grade 2
Lansing, Michigan
(October 1974 - February 1975)

ABSTRACT

Children in this second-grade class worked for five months on a Mass Communications challenge to use the fastest means to inform other students about what they liked and didn't like happening at school. The class worked in groups to develop six presentations--posters, crayon pictures, a photoboard, a tape-recorded message, intercom announcements, and notes for each classroom. Afterwards the students conducted a survey to determine which methods had best communicated their message. To find the total survey tally, they invited older brothers and sisters to help add the long columns of numbers and later they learned how to make bar graphs for displaying the survey results. The children distributed copies of the survey results to other classes and were especially pleased that two upper-grade classes used their information in selecting presentations for an advertising campaign.

My second-graders became involved in the Mass Communications challenge during a class discussion of the fastest way to communicate with other students at school. Our discussion originated from a principal's note asking students to refrain from writing on the walls of the girls' bathroom and also from a complaint within our class about the graffiti on the outside walls of the school. The children agreed that both complaints were valid and that a problem did exist. However, when we began to talk about how to improve the situation, the children first suggested that the principal or the teachers could talk to each class and tell students not to write on the walls. I then asked what could be done if the principal didn't have time to visit every class, and the students began listing other ways to communicate with the entire student body, such as writing poems to read on the intercom and putting up signs. Gradually, then we had focused our discussion from what the administration could do to what our class could do.

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*Edited by USMES staff

The students then worked in four groups to brainstorm ways to tell everyone that they didn't like to see writing on the school walls. The discussion in some groups also included other things that happened at school that the children didn't like, such as fighting. After about fifteen minutes, the class reassembled to hear group reports, which consisted primarily of things the children did like and didn't like happening at school. Our discussion ended with one boy's suggestion that we attach signs to helium-filled balloons and fly them over the school.

The following day we continued the discussion and viewed drawings that some children had made to illustrate ways we could communicate with other people. The girl who had complained about writing on the walls was still very concerned and expressed her eagerness for our class to tell other students about it.

Because some of the children seemed to have difficulty understanding that our class could tell the entire school, I posed the question, "What is the fastest way we can use to tell everyone how we feel about the school?" The children suggested the following ways:

signs (in hall, on doors)
send notes to classes
TV show, movies
tape-recorded messages
assembly program in gym
sign parade
puppet show
circus show
play
photographs

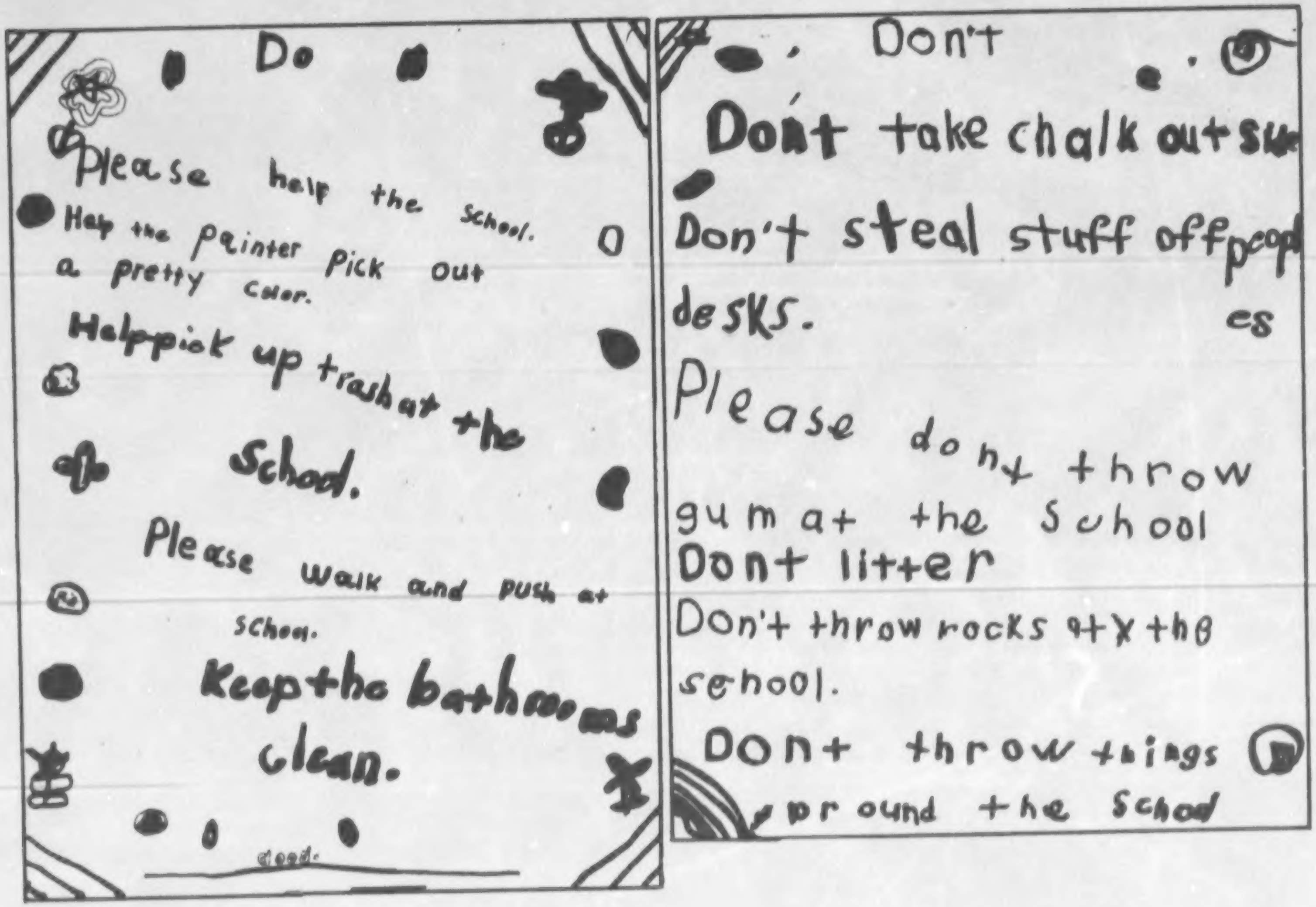
When we later discussed the various suggestions, several students mentioned that signs would be a good idea. They thought that we should have two kinds of signs giving both "Dos" and "Don'ts." The other children liked this idea, and they made the following lists of messages to use on the signs:

Do

1. Please help the school.
2. Help the painter pick out a pretty [wall] color.
3. Help pick up the trash at school.
4. Walk and don't push at school.
5. Keep bathrooms clean.

Don't

1. Don't take chalk outside.
2. Don't steal things off people's desks.
3. Please don't throw gum at the school.
4. Don't litter.



Do

Please help the School.

Help the painter pick out a pretty color.

Helppick up trash at the School.

Please walk and push at School.

Keep the bathrooms clean.

Good.

Don't

Dont take chalk outs

Don't steal stuff off peop desks. es

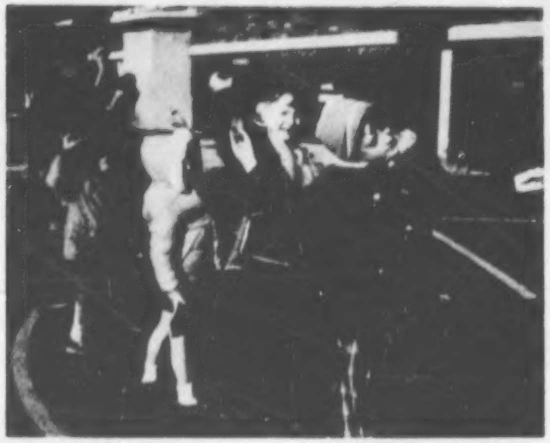
Please dont throw gum at the School

Dont litter

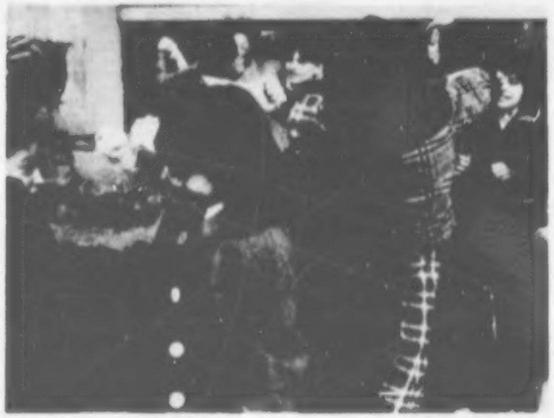
Don't throw rocks at the school.

Dont throw things around the School

Figure C1-1



Don't thorw rocks at the school.



Don't fight

Figure C1-2

5. Don't throw rocks at the school.
6. Don't throw things around at school.

The students' interest was very high, and they were eager to start work on their signs in the Design Lab. After some debate, the children decided to form only two groups, girls and boys, with each making one sign to list the "Dos" and "Don'ts."

Work began on the signs in the Design Lab and the following week we reviewed other ways to tell students how we felt about the school. The children decided to try the following six methods of communication:

1. signs
2. draw pictures
3. photographs
4. send notes to classrooms
5. radio message
6. make tapes

Everyone then selected a group, except for six students who returned to the Design Lab to finish the signs. (See examples in Figure C1-1.) The activities of each small group, which continued for about three weeks, are described in the following paragraphs.

Photograph Group

The children first discussed what they would like to photograph and then drew sketches of their ideas which they separated into "Do" and "Don't" pictures. (Two examples of "Don't pictures are shown in Figure C1-2.) One of their biggest decisions was selecting students to pose for the photographs. One boy suggested that the "bad" students who usually misbehaved should be in the "Don't" scenes, but the other children disagreed. They felt that his idea really wasn't fair; besides, they all wanted to be photographed.

The group agreed that one of their "Don't" pictures should be captioned "Don't sass." They had first thought that they would like to invite the principal to pose with a student for this photograph, but none of the students wanted even to pretend to sass the principal. They finally decided to change the caption to "Don't sass the teacher," and they invited another teacher to pose for the picture.

I used a Polaroid camera to take the first photographs of the children as they posed in the classroom. They really enjoyed it, especially the scene for "Don't fight in the classroom." Everyone was a real ham.

The next several days were very cloudy, and the children anxiously awaited a sunny day so that we could take the remaining shots on the playground. When the sun came out at

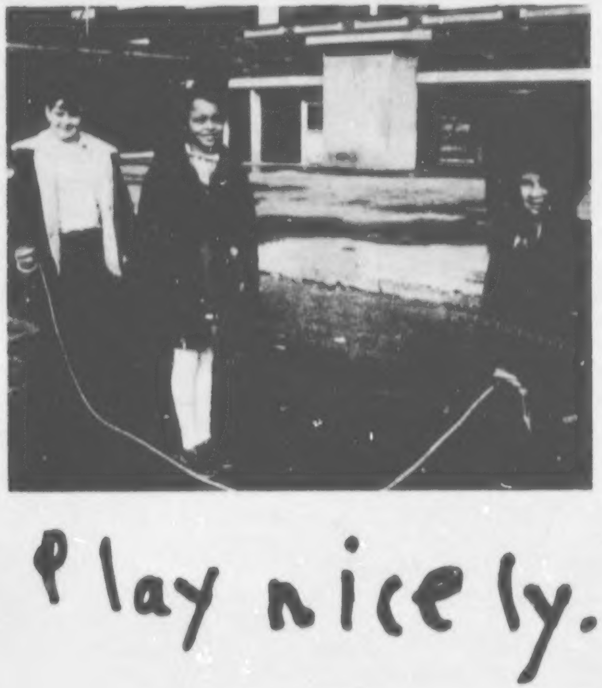

Play nicely.

Figure C1-3

last, another class was also outside, and so there was no lack of actors to pose for the "Don't" scenes--everyone wanted to get into the act!

From the photographs we took, the children selected eight, three "Dos" and five "Don'ts," which they decided were the most explicit demonstrations of their messages. The group then worked in the Design Lab to mount the photos on thick cardboard which they covered with tin foil. They used a red felt pen to print a caption under each picture explaining what the children either wanted or didn't want to happen at school. (See example of "Do" picture in Figure C1-3.) One of the boys expressed concern that other students might pull the photographs off the board. After some discussion, the group decided to cover the entire display with clear plastic wrap to avoid this problem.

Tape-recorded Message Group

The Design Lab manager worked with this group in the lab. The children first made lists of things that happened at school which they either liked (twenty-one items) or disliked (seventeen items). A sample from their message follows:

I. What we don't like happening at school:

1. We don't like fights.
2. We don't like people with money at school having it taken away.
3. We don't like bad words.
4. We don't like people looking in the windows.
5. We don't like wearing new clothes at school because we get all dirty and then our mothers will spank us.
6. We don't like people throwing milk at breakfast time.

II. These are things we do like happening at school:

1. We like to get our work done.
2. We like to bring in things at "Show and Tell" time.
3. We can play games with the big kids.
4. We like to come down to the Design Lab.
5. We like to play in the sand.
6. You can get to meet a lot of friends.

After the children had practiced reading the lists, they took turns reading one item at a time for the five-minute recording which they planned to play over the intercom system. This group especially enjoyed their activities because they liked to hear their voices on the tape. The children were very serious, and no one laughed when one boy included that he didn't like "sticking your middle finger out." The entire group agreed with him, and so I decided not to censor it.

Radio Script Group

This group had the most difficulty getting organized and deciding what they wanted to say for their live intercom announcement. They finally decided to follow a procedure similar to that of the Tape Group, and they made lists of the reasons they liked school (e.g., the school is clean, we like to sing songs) and the things they didn't like (e.g., we don't like fights, we don't like to play rough).

Crayon Picture Group

The children in this group drew large caryon pictures tc illustrate things that happened at school. Several showed a happy school; another showed a safety patrolman helping children dressed in Halloween costumes to cross a street (see Figure C1-4). The real artist of the group even drew a picture of the principal shooting a student who was littering.

When the pictures were completed, the children mounted them on oaktag in the Design Lab. Several students discussed making frames for the pictures. One boy's suggestion to make squiggly lines around the borders was readily accepted as the solution.

Note Group

These children decided to send notes to each classroom asking students to help them make the school a better place. At first they seemed to have problems deciding how to word their message. I worked with them during one session, and the message was written. The children decided that two group members, who were the best spellers, should do most of the writing. The others assisted by surveying the school to compile a list of room numbers and teachers. This was quite an undertaking for them because our school is a large, three-story building, and they were unfamiliar with most areas outside the primary classes.

These same children also helped by proofreading the finished notes. They soon discovered that the writers were so

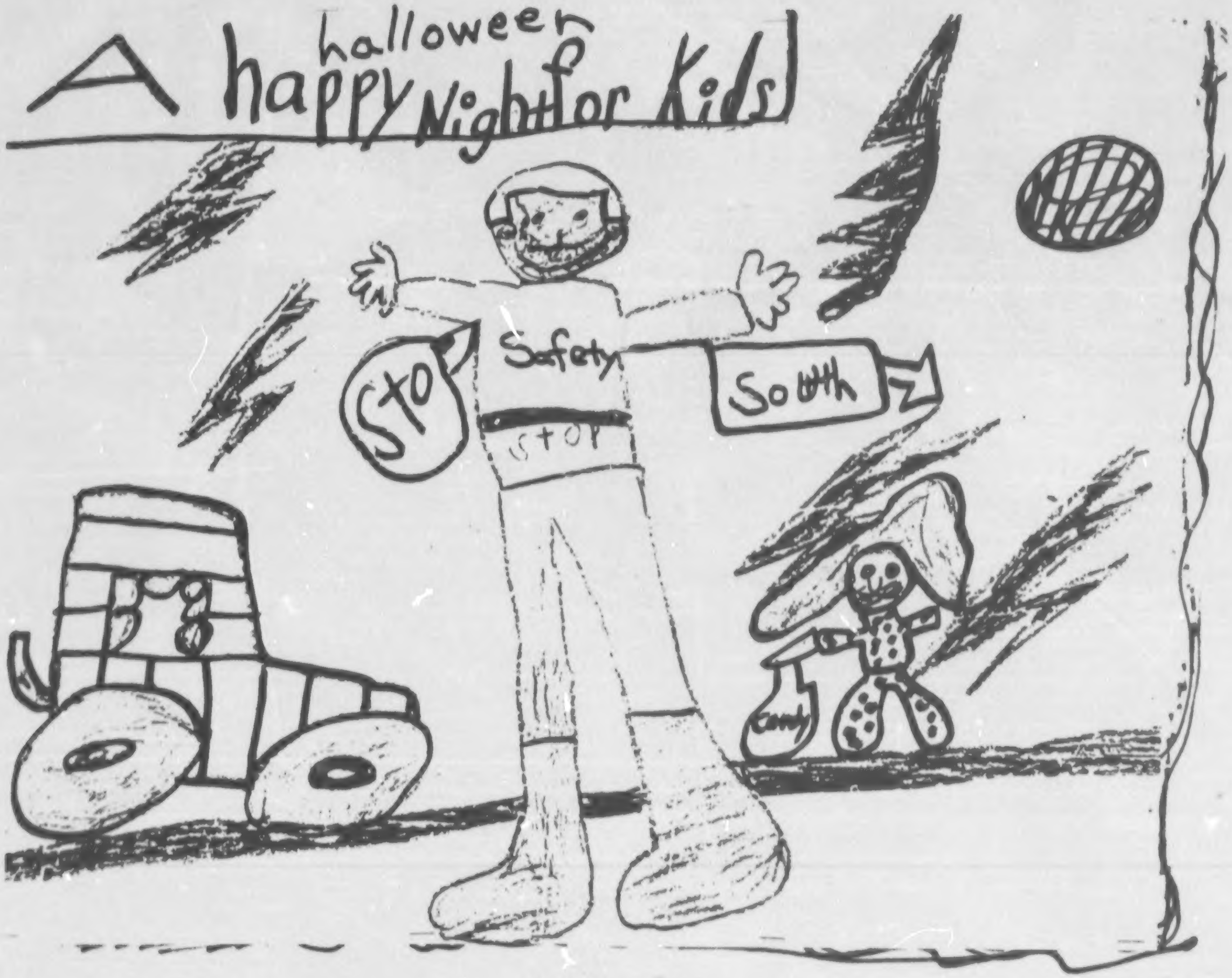
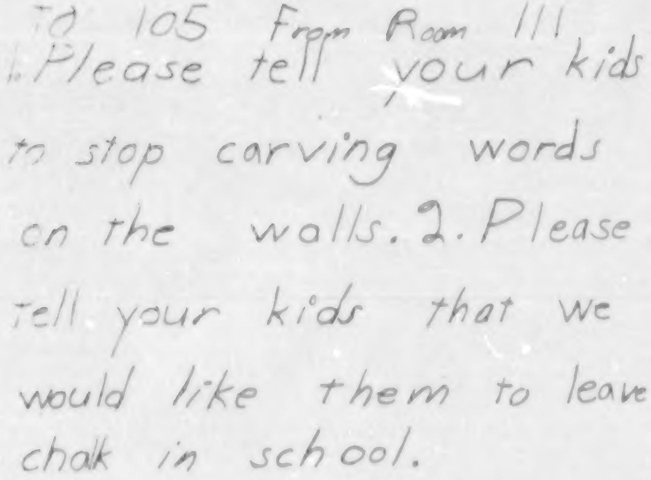

A halloween happy Night for Kids
Safety
Sto
STOP
South
Candy

Figure C1-4



To 105 From Room 111
1. Please tell your kids
to stop carving words
on the walls. 2. Please
tell your kids that we
would like them to leave
chalk in school.

Figure C1-5

intent on copying the exact words that they were copying the same room number on all the notes. The wrong numbers were carefully erased and the correct ones filled in. Because they realized that other people would be reading their notes, the children were very careful to form their letters correctly. It was the neatest printing I had seen in a long time. (See Figure C1-5.)

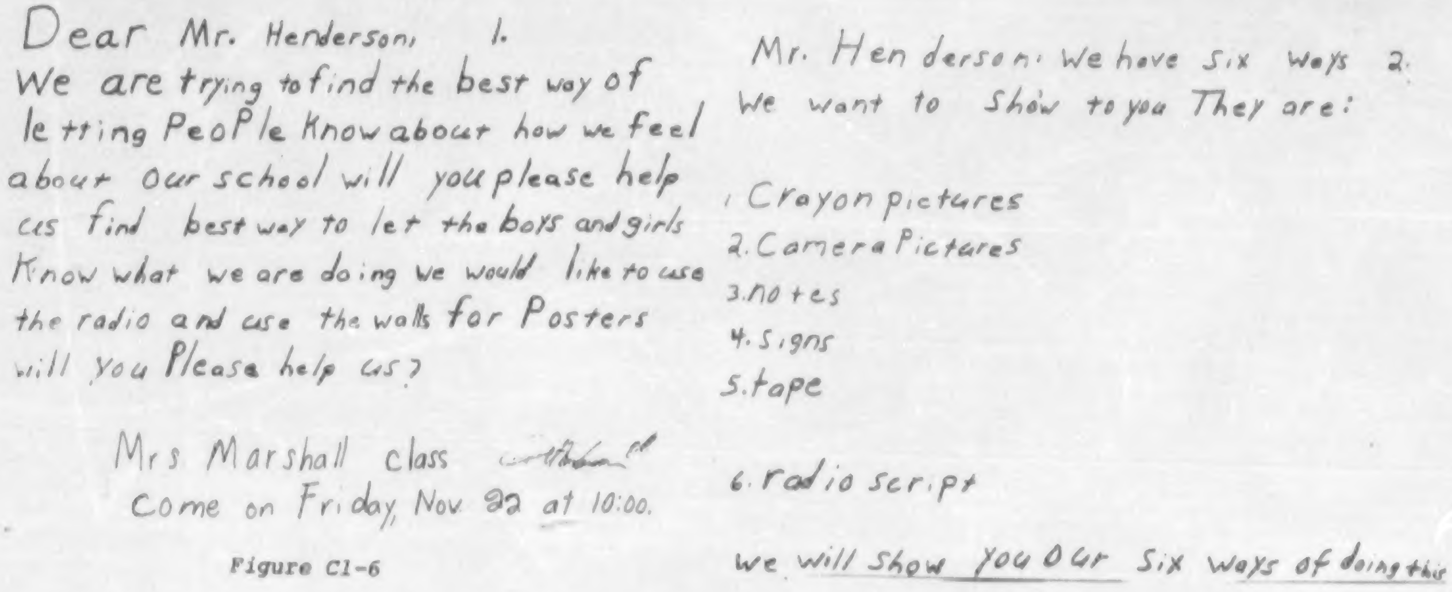
* * * * * * *

When all the groups had finished their work, we had a class discussion to decide what our next action should be. The children felt that before using any of our messages, we should first obtain permission from the principal. Because this was a class effort, we decided that we could best explain our work by making a class presentation. Together we composed an invitation to the principal, which I wrote on the board.

When the note was read, the children felt that it looked long but sounded short. To make it longer and to provide an added incentive for the principal to view the work, they decided to list the six projects they had prepared. The class selected one of the boys who was a good printer to copy the note (see Figure C1-6), and a girl was chosen to read the note to the principal. The invitation was completed right away, and the girl returned with good news: the principal had set a specific day and time during the following week when he would visit our class. The children were delighted.

The following day we discussed the format for our presentation to the principal. There were many suggestions offered, particularly regarding the number of people from each group who would describe that group's work. Some students wanted only one person to speak, others preferred four people reading in unison, and others suggested having two people talk. We discussed the different methods and then voted. The students elected to have two people describe the group project while the other members of the group held up their work.

The groups then decided what they would say to the principal, and as each group dictated, I wrote the message on the board, and one of the group members copied it. (See Figure C1-7.) They chose two people who would make the presentations and suggested that the speakers take the notes home to practice reading them. As some of the second graders had difficulty reading the words, I mentioned that their parents might help them to practice.



Dear Mr. Henderson, 1.
We are trying to find the best way of letting PeoPle Know about how we feel about our school will you please help us find best way to let the boys and girls Know what we are doing we would like to use the radio and use the walls for Posters will you Please help us?

Mrs Marshall class
Come on Friday, Nov 22 at 10:00.

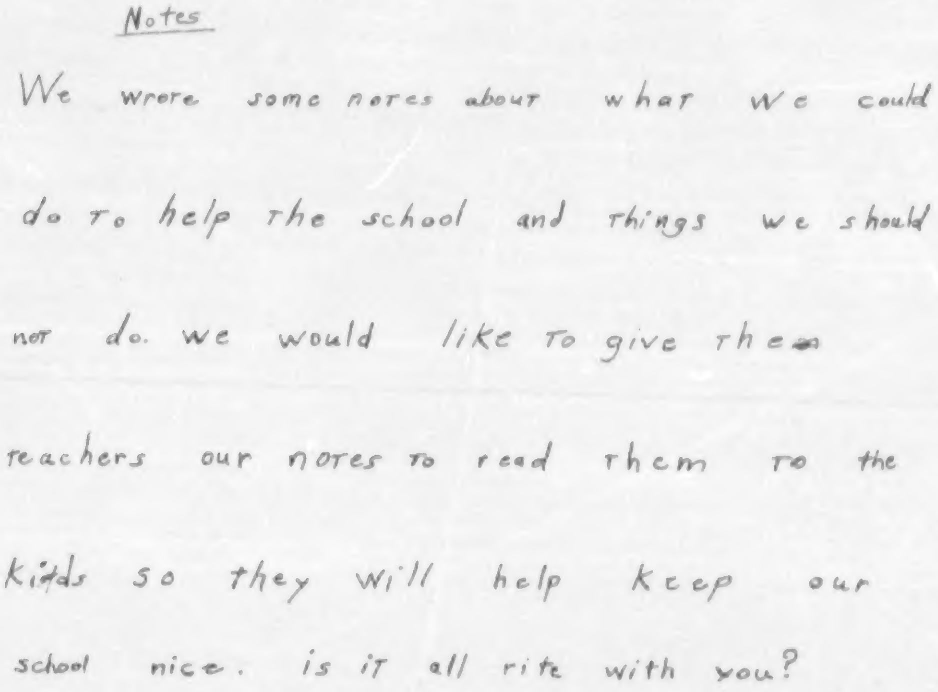
Mr. Henderson, We have six ways 2.
We want to Show to you They are:

1 Crayon pictures
2. Camera Pictures
3. notes
4. Signs
5. tape

6. radio script

we will Show you Our six ways of doing this

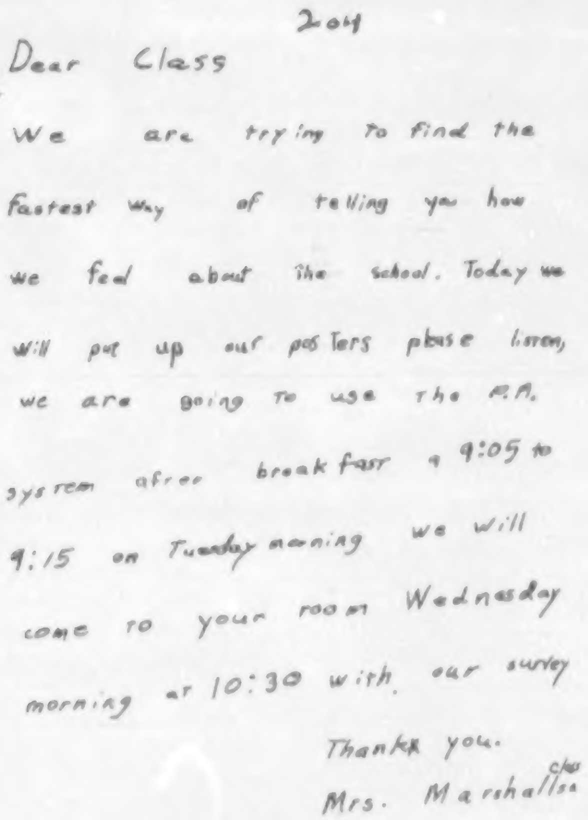
Figure C1-6



Notes

We wrote some notes about what we could do to help the school and things we should not do. we would like to give them teachers our notes to read them to the kids so they will help keep our school nice. is it all rite with you?

Figure C1-7



204

Dear Class

We are trying to find the
fastest way of telling you how
we feal about the school. Today we
will put up our posters plase listen,
we are going to use the P.A.
systrem afrer breakfasr a 9:05 to
9:15 on Tuesday morning we will
come to your room Wednesday
morning at 10:30 with our survey

Thankk you.
Mrs. Marshalls clas

Figure C1-8

On the day of the presentation, the children worked very hard to clean and straighten our classroom. Everyone greeted the principal, and then each group began reporting on their activities. I was very pleased that when one boy forgot some of the words in his report, the other members of the group helped him, and no one laughed.

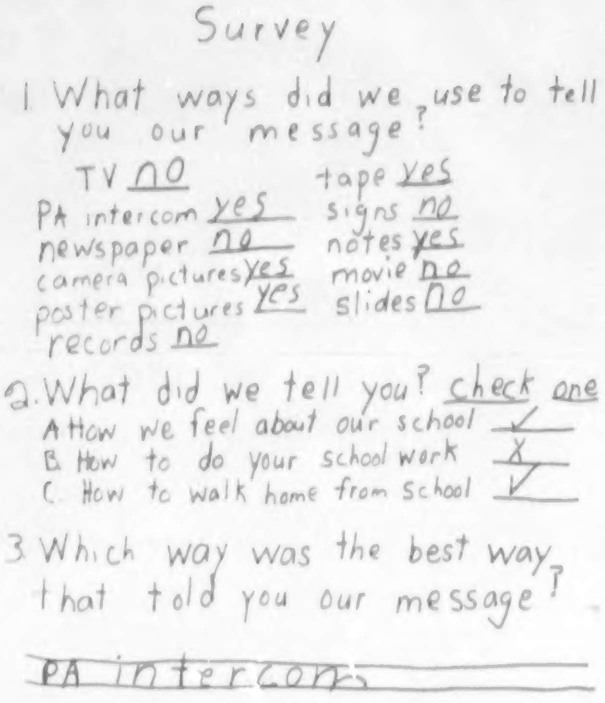
The group presentations lasted about fifteen minutes, and afterwards the principal gave us permission to use all the work whenever we were ready. The students were so happy, they applauded. I was really proud of everyone. I have never seen such a calm, cool group as they were that day. They knew exactly what they wanted to say, and they said it.

After Thanksgiving we met to discuss how we would use our messages. One of the first questions a student asked was, "What do we do now?" I returned the question to the students, asking them what they wanted to do. Someone mentioned that we could find out which was the best way to tell other students how we felt about school. I explained that the name for what they wanted to do was a survey. That meant asking other people questions and then counting their answers. The children agreed that this was a good idea, but they thought that before using the six methods, they should first tell their schoolmates what they should first tell their schoolmates what they were planning to do. Volunteers formed a committee to draft a letter to other classes describing the purpose of our activities (see Figure C1-8).

We next decided to deliver the notes and put up the posters, signs, and photoboard on one day, followed by the radio script and tape presentations the next day. The children thought that this second afternoon would also be a good time to conduct their survey to determine which of the methods had attracted the most attention.

On the day we began using our communications methods, the Letter Group finished their final copies, and one of the boys prepared a list of rooms and teachers. Children volunteered to go in pairs to a room of their choice (usually where they had a brother or sister) to deliver the letters and also the messages from the Note Group. I was pleased that no one got lost in our large school and that no one abused the privilege of working without my supervision.

While the messengers were visiting classrooms, I stayed with the remaining students who selected areas around the school to hang the crayon pictures and signs. They decided to place the photoboard outside our room so that we could keep an eye on it. We also stopped by the main office, and the school secretary put the Radio Script and Tape Groups



Survey

1 What ways did we use to tell you our message?

TV no
PA intercom yes
newspaper no
camera pictures yes
poster pictures yes
records no
tape yes
signs no
notes yes
movie no
slides no

2. What did we tell you? check one
A How we feel about our school ✓
B How to do your school work X
C How to walk home from school ✓

3 Which way was the best way that told you our message?

PA intercom

Figure C1-9

on the intercom schedule for the following morning. This session was really a great experience in working together for all the children, and I heard several students comment, "This is fun!" The other teachers were generally very cooperative with our messengers, and we noticed that many students were soon stopping to look at our posters and signs.

The next day, after the oral announcements had been made, teams of two children delivered the survey to each classroom. The response was generally good, but not all the teachers participated in having their classes complete the surveys, and we did run into some other problems. The children who delivered the surveys were not consistent in explaining how to fill them out; therefore, some responses were made with check marks and others were written with "yes" or "no." (See one survey in Figure C1-9.)

Although the children from the third grade up were able to read and to complete the survey without assistance, the younger children had difficulty. Some of the primary teachers had read the questions aloud and had asked the students to raise their hands for "yes" or "no" votes. Too late we realized that our survey was actually geared toward older children and that it would have been easier for everyone if we had made a simple checklist.

The December vacation interrupted further activities until January. When we again met for an USMES session, I distributed the completed surveys to the children and waited to see whether they could think of a method for tallying the votes. When, after about twenty minutes, no one seemed to have a solution, I collected the surveys.

The next day I gave a skill session on tallying, and we then worked as a group to tally the results from one class at a time, with each child checking one paper. As I read each survey question aloud, the children raised their hands if a response had been checked on their copies. We counted the number of hands and recorded the number on the board.

One girl was very upset and said it was "terrible" that on the first question some people had checked items, such as movies, when we hadn't even used those methods. On the third question, the children were distraught that some of the answers were in cursive writing, which they couldn't read. I made an arbitrary decision, which invalidated this question, and told the children to ignore the answer if they could not read it.

During this period we were able to tally the surveys from three classes. One of the children recorded the results from the board for future use in making a total tally. By the third session of tallying, the children were able to work in small groups by themselves to complete the surveys of the remaining two classes. I felt very unneeded but really pleased with the children's initiative and cooperation.

One of the reasons for the children's enthusiasm for tallying the surveys was a request from two upper-grade classes for copies of our results. These classes were planning advertising campaigns for their school store, and they were interested in knowing which of our communications methods had attracted the most attention. My children were very excited about the prospect of sharing their information with older children.

With the survey of each class tallied, I asked the children what we needed to do next. There were various suggestions, including "Throw them away," "Give them to the older students," and finally, "Count them."

We used a procedure similar to the one used to tally the responses from each class. The children sat in small groups with each group responsible for the total tally from one class. On the board I wrote the names of the teachers for each of the ten classes that we had surveyed. Then, as I called the teacher's name, the group of students who had the total tally of that class supplied the number of votes for a particular item. They were so involved with the tallying and the room was so quiet that I actually could have heard a pin drop.

During this session we completed the first three items for question one. Our results are shown below:

QUESTION I: What ways did we use to tell you our message?

	1. TV	2. PA System	3. Newspaper
Teacher #1	4	12	4
2	0	20	4
3	5	13	3
4	13	2	2
5	2	6	7
6	0	14	8
7	6	6	0
8	3	4	5
9	4	12	6
10	0	15	5

We finished recording the votes from all the classes at the next session. During a discussion of what we should do with all the numbers, I listed on the chalkboard the following suggestions from the children:

1. Make copies of the numbers.
2. Put copies of the results all over the school.
3. Someone could go to the rooms and explain the numbers.
4. Run it through the copier and make lots of copies.
5. Children from our room could deliver the copies.

I then asked the class about the students who wouldn't be able to add the long columns of numbers. The children quickly realized that they needed to total the columns before people would be able to understand their survey results. However, because they had had little experience with adding so many numbers, they felt incapable of performing the computation by themselves. They immediately thought of using the class adding machine which had been donated by one student's father. While we were discussing who would use the machine, one student offered another suggestion: maybe his older brother could help add the numbers. The other children quickly picked up on his idea, and many offered to invite their older brothers and sisters to help. We agreed to ask five upper-grade students to assist with the addition.

On the day we added the columns of numbers, the children were beside themselves with enthusiasm. We ended up with eight helpers, several older brothers and sisters, as well as the father who had loaned us the adding machine. He also brought along a hand calculator for our use during this session.

I wrote the columns of numbers on the board, and the children teamed up with their older partners to add them. The first group to finish each column called out the answer, which was then checked by a student using the calculator. Two of our student helpers were real math "whizzes" who gave the machines a good race. All the children had an opportunity to use both the adding machine and the calculator, and we added all the columns during this period, as shown below.

1. What ways did we use to tell you our message?

TV	46	*Notes	67	Movie	24
*PA	104	*Camera	52	Slides	23
*Tape	82	*Posters	100	Newspaper	44
Signs	67	*Records	21		

2. What did we tell you?

*How we feel about our school	147
How to do your schoolwork	42
How to walk home from school	39

3. Which way was the best way that told you our message?

*Intercom	40	*Signs	14
*Posters	22	Tape	8

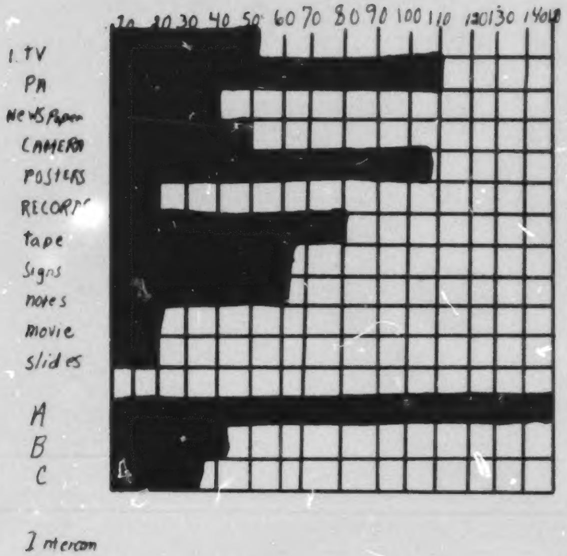


Figure C1-10

In our next session I used the "How To" Cards to teach a skill session on graphing. I distributed graph paper and explained how to count the squares and label the axes. We completed several examples together and then the children worked individually. They were so interested in this new way to show their survey results that, on their request, I extended the length of the session. Although some children did have difficulty, more than half the class understood the procedure and began making their graphs correctly after this initial introduction. (See example in Figure C1-10.)

We continued working on the bar graphs for several sessions and I helped the children who were having problems. Some of them had difficulty understanding that one square equaled ten votes. Other students had failed to start their bars from the same vertical line, and a few had erased the numbers from their graphs.

While I continued to work with these children, the other students who had completed their graphs met to discuss what to do with the survey results. They decided that the information should be dittoed and given to each class at school. Later the entire class agreed to this plan, and when they made the copies, we used the same distribution system that we had previously used; i.e., students chose partners and delivered the surveys to each teacher. The children also requested that the results be read aloud in class, but we didn't know whether this was always done.

We were all very interested to see whether the two upper-grade classes, who had specifically requested our results, would use our information. The children were thrilled when they heard the sixth graders' intercom announcements about their school store; this had been our most successful method of communication. The children were very pleased with their

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*Media we used

work. Besides informing people of how they felt about school, they had also been able to provide useful information to other students.

2. LOG ON MASS COMMUNICATIONS

by Linda Anderson*
Vista View School, Grades 5-6
Burnsville, Minnesota
September 1975 - January 1976

ABSTRACT

Students in this intermediate-level class worked for four months on their Mass Communications challenge to make their schoolmates more aware of America's bicentennial celebration. Various groups were formed to carry out different activities and as the tasks were completed, new groups were formed. For hall decorations, groups worked on display cases, bulletin boards, a wall hanging made from burlap, a five-foot by six-foot poster, and many posters for their "Bicentennial Wall." They also made weekly intercom announcements, conducted several surveys, and made an original seven-minute slide/tape show. One group coordinated the bicentennial activities for the entire school and helped set up the February Open House as the culminating event. The class also arranged to have their weekly announcements continued by different homerooms and to have the Pledge of Allegiance said by the entire student body once a week. Because of the class's efforts and their schoolmates' cooperation, the school was awarded a Minnesota Bicentennial Youth Certificate signed by the governor.

We began our unit by discussing mass communications and discussed telling many people about some topic. We then talked about what things we might like to tell others and listed these things on the board. This continued for some time and soon the board was full.

We immediately realized that we had too many things and that some of them (food, universe, space, flowers, beautiful, Super Bowl, wire fences, lake cabins, shoelaces, candy store) were too broad or too silly. We began eliminating some of them by a show of hands, but the period ended before we had finished.

During the next session we pared the original list of 102 items to 37. Then, at the suggestion of one girl, we agreed that each child should write on a piece of paper those items remaining that he or she would like to tell others about. The students turned in their lists, and two girls tallied the results on the board. We decided to keep those which received four or more votes; this left 18 items.

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*Edited by USMES staff

At the next session the class voted for their top five choices and agreed to keep only those items receiving five or more votes. The remaining choices were candles, television, (U.S.) Bicentennial, animals, USMES, and games. We then discussed what we would do with each of the topics. After this discussion we voted again and television, the Bicentennial, and animals were chosen.

The group favoring the Bicentennial then pointed out that we could do many things--for example, skits telling about the war and about famous people--and then noted that we would never see another centennial. Some students then changed their votes, and we settled on telling others about the U.S. Bicentennial--"Find a good way to help people at Vista View School be more aware of our nation's 200th birthday."

Small groups of students worked on a variety of activities and as goals were reached, new groups were formed to carry out additional tasks. The major undertakings of several groups are described in the following paragraphs.

Intercom Announcements

One of the first groups formed by the class was the Intercom Announcements Group. The principal gave them permission to make weekly announcements, on Wednesdays between 8:30 and 8:40.

The day before the first announcement I met with the group in the media center. The boys had selected a recording of the "Star Spangled Banner" to use as an introduction and also background music, but I soon learned they had accidentally erased the tape recording of their announcement and they had also lost the script. They agreed that they did need a written script and with time running out, I acted as group secretary, writing down what they dictated. They had lots of good ideas, but they didn't always agree. However, I made sure that they reached decisions and soon they had a narration for their tape. One boy then automatically assumed responsibility as narrator and began practicing the script.

On one point the group had been unable to reach any agreement: the students couldn't decide whether or not to ask the classes to stand and say the Pledge of Allegiance along with the tape. The narrator resolved the indecision by asking that it be repeated with him. The first take of the recording was going very well until the narrator made a mistake in reading, and the tape was stopped. The students were going to try to pick it up again at the same point until they realized how difficult it would be to get

"Good morning! It's time for our Bicentennial moment.

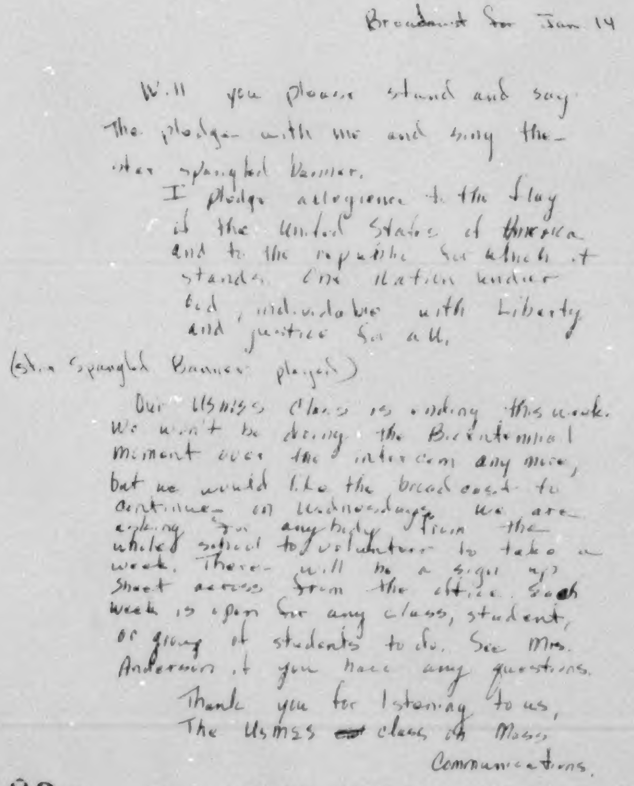
The week before last we informed you that 15 classrooms didn't say the pledge. We are happy to inform you that after two weeks now we only have 10 classrooms not saying the pledge and 4 are going to start.

We would like to encourage you to say it and to you who do say the pledge, thank you. If you haven't already said it this morning would you please stand and say it with me?

I pledge allegiance....

Thank you!"

Figure C2-1



Broadcast for Jan 14

Will you please stand and say the pledge with me and sing the star spangled banner.

I pledge allegiance to the flag of the United States of America and to the republic for which it stands one nation under God, indivisible with Liberty and justice for all.

(Star Spangled Banner played)

Our USMES Class is ending this week. We won't be doing the Bicentennial moment over the intercom any more, but we would like the broadcast to continue on Wednesdays. We are asking for anybody from the whole school to volunteer to take a week. There will be a sign up sheet across from the office. Each week is open for any class, student, or group of students to do. See Mrs. Anderson if you have any questions.

Thank you for listening to us,
The USMES class of Mass
Communications.

Figure C2-2

the background music synchronized. When I left, they were starting on take two.

The next morning I sat with crossed fingers waiting for the tape to be played. The school secretary introduced it by saying the USMES class had an announcement about the bicentennial. The tape was a little loud at first but someone must have told the students because they turned it down. It was quite clear and understandable, and I was very impressed. My homeroom, which was one that had not been saying the Pledge of Allegiance, stood and said it with the narrator who later returned to class beaming. (See Figure C2-1 for a copy of the narration.)

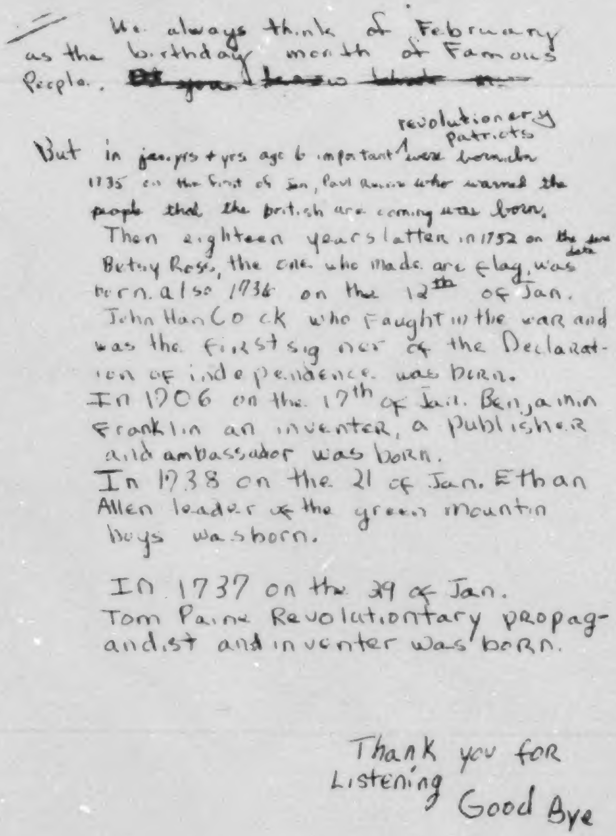
The same group of students continued setting up and making the announcements for the next several weeks. Their greatest problem always seemed to be deciding on a topic and getting a narration written down. I helped again the second week by writing down their ideas, but afterwards I left them to do the organizing on their own. They sometimes did research in the library on such topics as the Boston Massacre.

One week the group was very slow in getting all their material together, and when they tried to make their tape with a new phonograph recorder, they ended up with only music and no narration. One of the boys promised to prepare and practice a narration at home, but the next morning he said he had forgotten. Our announcement that day was just music and the boy's brief excuse to the school:

> "Due to technical failure in making the tape, we just have the 'Star Spangled Banner' for you. Thank you. That is all."

After several weeks the announcements were made by different volunteers in class. (See Figure C2-2 for one of the later broadcast scripts.) While many of the students did a good job, I was disappointed in some who appeared to be satisfied with anything they could put together. One group of students, for example, used jokes about colonial life from a bicentennial book. The jokes were rather cute, but the students tried to disguise their voices, using phony English accents, and they themselves laughed so much at the jokes that it was difficult to understand them.

Near the end of our work on the challenge the class decided that it would be worthwhile for the Wednesday announcements to continue, even though we would no longer be together as a group. The students decided to open up the announcements to other classes and to use our final week to



We always think of February as the birthday month of Famous People. ~~Bt you know what~~

But in jan. yrs + yrs ago 6 important revolutionery patricts were born in 1735 on the first of Jan, Paul Revere who warned the people that the british are coming was born.

Then eighteen years latter in 1752 on the same date Betsy Ross, the one who made are flag, was born. also 1736 on the 12th of Jan. John HanCock who Faught in the war and was the first signer of the Declaration of independence was born.

In 1706 on the 17th of Jan. Benjamin Franklin an inventer, a publisher and ambassador was born.

In 1738 on the 21 of Jan. Ethan Allen leader of the green mountin boys was born.

In 1737 on the 29 of Jan. Tom Paine Revolutiontary propagandist and inventer was born.

Thank you for Listening Good Bye

Figure C2-3

ask for volunteers. One of the girls offered to make a large sign-up sheet to place in the office, and another girl offered to prepare the last script. I was delighted with the second girl's offer. She tended to be such a follower and rarely showed any initiative, but she really took charge of the three-member script-writing group. (See Figure C2-3 for a copy of their script for the final broadcast.)

Surveying

During the course of our work on the challenge, several different survey groups were formed for various purposes.

One survey was taken to find out whether students knew the answers to several questions on American history. Our Survey Group devised two sets of questions and used a tape recorder to interview three or four students from each classroom. Kindergarteners through second graders were asked the following questions and provided with multiple choice answers:

1. Who made the first flag?
2. What do we do on July Fourth?
3. When is our nation's 200th birthday?

Students in grades three through six were asked these questions without any multiple choice answers:

1. When was the Declaration of Independence signed?
2. How long is our nation's bicentennial going to last?
3. When is the next bicentennial going to be?

Two of the girls who helped to conduct this survey later formed a group to make a board game to help students learn American history. They used colored oaktag and felt-tip pens to make the boards and then they made up questions and answers for the cards. By the end of our unit, the girls had three completed games to put in our school library.

Another survey was devised, as the students explained it, to find out how much "Americanism" was at school, and they asked all the teachers the following three questions:

1. Do you say the Pledge of Allegiance in your homeroom?
2. Do you have a flag in your room?
3. Would you be willing to do a project for the bicentennial?

The survey results were later placed on a chart and reported to the class. Only two rooms didn't have flags, while twelve homerooms said the pledge and fifteen didn't This information was later relayed to the entire school by the other students making intercom announcements.

After classes had begun to say the Pledge of Allegiance on a more regular basis, the students decided to find out how their schoolmates felt about it. They interviewed only the upper-grade classes and received an overall negative reaction.

When we were discussing the results and the reasons that older students felt as they did, someone mentioned that our data would probably reflect a different attitude if primary students were included. Several students volunteered to find out whether this hypothesis were true. When the results were tallied, we saw right away that primary students were much more responsive to saying the Pledge of Allegiance than older students.

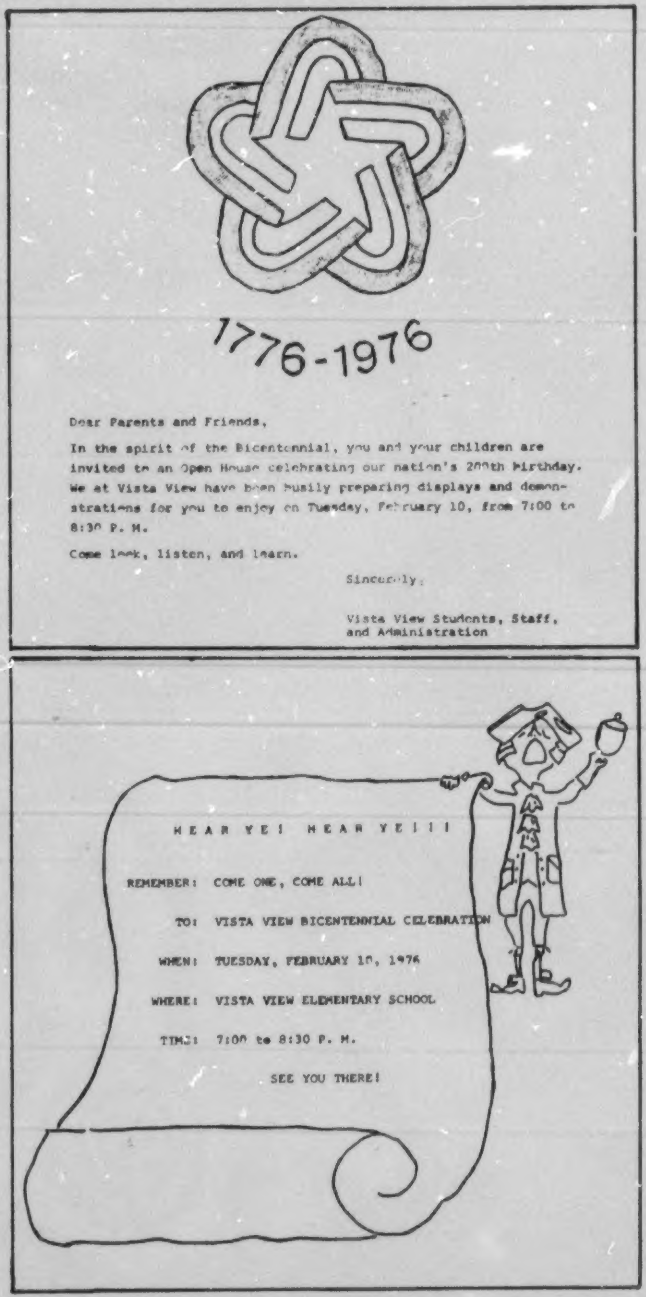
These survey results were reported to the principal who then visited our class to share her feelings about saying the Pledge of Allegiance. She said she would like for everyone at school to say it together at least once a week--on Mondays, for example--and she asked our class to try to set up something to use on the intercom.

The students agreed to the principal's suggestion, and after she left, we discussed the possibilities. The general feeling was that they, as a class, did not want to take the responsibility of leading the Pledge of Allegiance every week, but they did have other suggestions.

The class finally decided to find as many teachers as would be needed to finish the year to take a Monday for their homeroom. Each class could then decide what to include with the Pledge of Allegiance, such as a poem or song. Two girls volunteered to organize everything and to make out a schedule for the remaining weeks of school. At someone's suggestion, we asked the principal to lead the Pledge of Allegiance the first week, and we had no difficulty getting teachers to sign up for the remaining weeks.

All School Group

Soon after the class had started working on the challenge, the principal asked me to attend a district workshop presented by the State Department of Education Youth Coordinator for the Bicentennial. I arranged for three students to accompany me, and we learned that every school was expected to celebrate the bicentennial in some way. Schools in which the students themselves organized and



Dear Parents and Friends,

In the spirit of the Bicentennial, you and your children are invited to an Open House celebrating our nation's 200th birthday. We at Vista View have been busily preparing displays and demonstrations for you to enjoy on Tuesday, February 10, from 7:00 to 8:30 P. M.

Come look, listen, and learn.

Sincerely,

Vista View Students, Staff,
and Administration

HEAR YE! HEAR YE!!!

REMEMBER: COME ONE, COME ALL!

TO: VISTA VIEW BICENTENNIAL CELEBRATION

WHEN: TUESDAY, FEBRUARY 10, 1976

WHERE: VISTA VIEW ELEMENTARY SCHOOL

TIME: 7:00 to 8:30 P. M.

SEE YOU THERE!

Figure C2-4

carried out bicentennial activities would be awarded a Youth Bicentennial Certificate signed by the governor.

At the next USMES session we reported to the class on the meeting and discussed what part our class's challenge could play in Vista View's bicentennial celebration. We finally decided that a small group of students could organize and coordinate the school's bicentennial activities. The principal was enthusiastic about our proposal and suggested that we use the February Open House as a culminating event for the school activities. That idea fit right in with the class's original plans to present a total school program.

Several of the girls wrote letters to the classes explaining the meaning of the bicentennial and the reason for the school's activities. They also enclosed a list of forty-nine possible projects, many of which had been suggested at the district workshop we attended.

The group also used information from the workshop to write away for free materials on the bicentennial which we placed in the media center for teachers to use with their classes.

To avoid duplication of projects, the girls placed a sign-up chart in the office and set up their own chart to keep a record of what each class decided to do. One of the students also came up with the theme word, "Celebrate," which we used on all communications to the school. When some teachers were rather slow about meeting deadlines, the group sent reminders and also got in touch with them personally.

When all the classes had selected a bicentennial project, this group focused on plans for Open House night. They sent notices to each teacher asking about any special requirements of their classes, such as whether certain space or a particular time would be needed.

One of the girls made four or five samples of Open House notices that could be sent to parents. The principal said that two notices could be sent, one to go home the week before Open House and the second to be sent the day before. (See Figure C2-4 for copies of the two letters that were sent.)

Posters and Displays

Several different groups worked at various times on posters, wall decorations, bulletin boards, and display cases for the corridors. The Poster Group worked during the entire challenge on a variety of posters while the other groups were more temporary; they were organized when a need

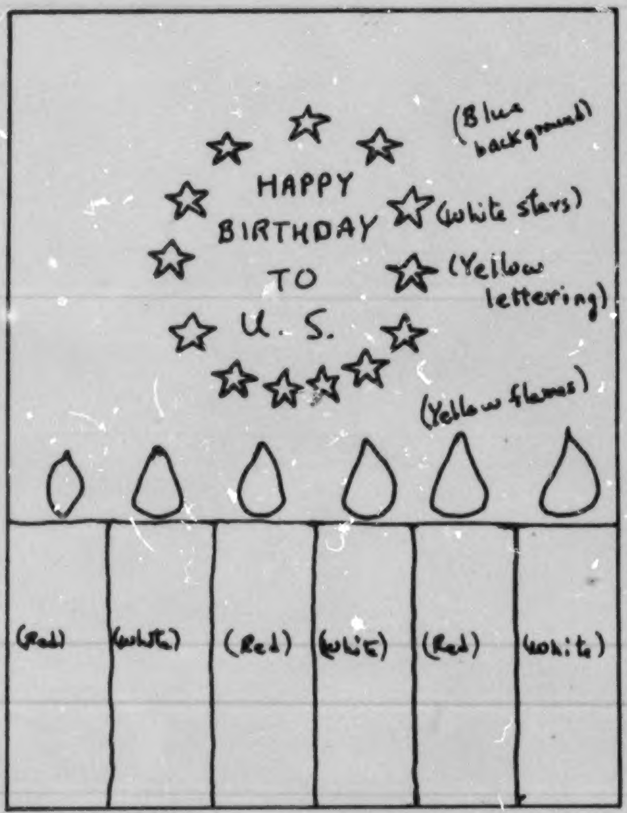


Figure C2-5

for them arose, they completed their tasks, and the members then joined other groups.

The Poster Group first worked on a huge cardboard poster, about five feet by six feet, of a design they copied from the cover of a bicentennial book (see facsimilie in Figure C2-5). They first painted the entire background blue and then painted on the other colors. They soon discovered, however, that the additional coats of paint chipped off easily, and so they scraped off all but the blue paint and used colored paper for the letters, stars, and candles.

When the poster was completed, the students obtained the principal's permission to hang it in the center hall. They decided to hang it on wires from the metal strips in the ceiling which they measured as twenty-four inches apart. To determine where to place the wire in their poster, the students used a book as their measuring tool and then a hammer and nail to punch the holes. Because we didn't have access to a ladder, several students asked the custodian to hang the poster which they left for him.

Several members of this group next made a poster of the Liberty Bell. They found a picture in a book which they placed in the opaque projector so they could trace the design. No gray markers were available, and so they decided to use paint, mixing white and black to get a light gray. The girl who was mixing soon learned a valuable lesson. She began by adding white paint to black, but before she even came close to getting the shade she wanted, she had gobs of gray paint. She later told me that when mixing paint, one should start with the lighter color and add the darker.

After Christmas vacation, the group came back to find that their unfinished Liberty Bell had been badly torn. After a brief consultation, the students decided to start again with gray construction paper, using their old model as a pattern.

Other students worked on "serious" and cartoon posters depicting colonial scenes, such as Washington crossing the Delaware, the Boston Massacre, and the Mayflower. After Christmas vacation the group decided that rather than placing the posters in various locations around school, they'd put them all on one wall in the main hall and call it "Bicentennial Wall."

Among the other corridor displays made by the class was a bulletin board entitled "The Declaration of Independence and the Bill of Rights" and a display case, "Our 200th Birthday," showing library books on American history. Two girls, who had finished their group work early, spent the last couple of weeks making a wall hanging of a cannon, using gray burlap and yarn.

Slide Show

Toward the end of November several girls who had completed work on the display cases were looking for something else to do. I met with them and they mentioned preparing something to present to primary children on the meaning of the bicentennial. I thought that was an excellent idea and discussed with them the types of media presentations that would be appropriate. They weren't very interested in videotape, but were quite excited by the prospect of making their own slides.

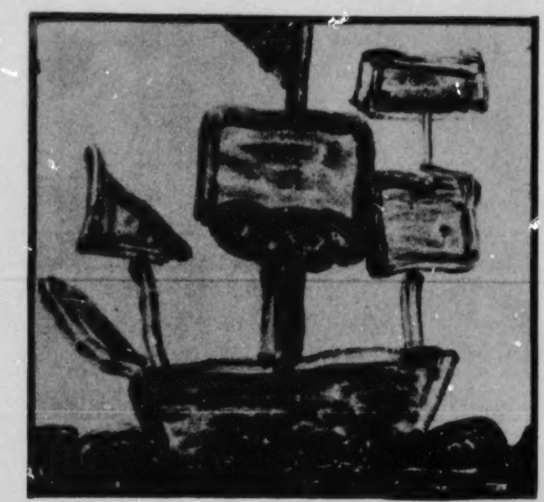
I provided some resource books on slide-making, and we looked through them together, noting that a slide show involved two major steps: (1) planning and making a narration and (2) planning and making the slides. The girls decided that to be really informative about the bicentennial, they would need to start with the Pilgrims and explain how we became a free and independent country. We discussed how complicated this could be and how, since primary children were their intended audience, they'd have to keep everything short and very simple.

The girls were so eager to begin, they started work right away drawing squares for their slides on a large sheet of paper. They worked diligently from the end of November until their slide show was presented at Open House. Even with occasional set-backs, such as losing the paper with almost all their squares drawn, the girls never got discouraged. They had started to redraw all those squares when I suggested Thermofaxing a page from the resource book to make a ditto master of squares. The girls agreed and were soon working out the details of their slides.

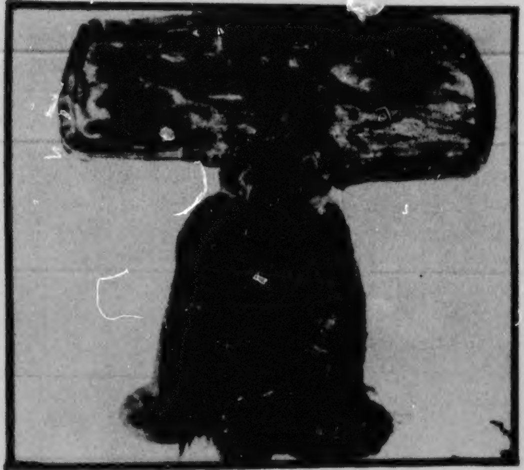
When they had drawn up quite a few pictures, they chose twenty-four to form the basis of their slide show. These drawings were transferred to acetate with the pictures outlined in black on one side and colored in with markers on the reverse side to avoid smearing.

With the slides completed, the group next wrote an accompanying narration which they recorded. We found a bell in the supply room which they used to indicate that the slide should be changed. When they listened to their first recording, they discovered the bell was so loud that they decided to redo the tape--this time with the bell across the room.

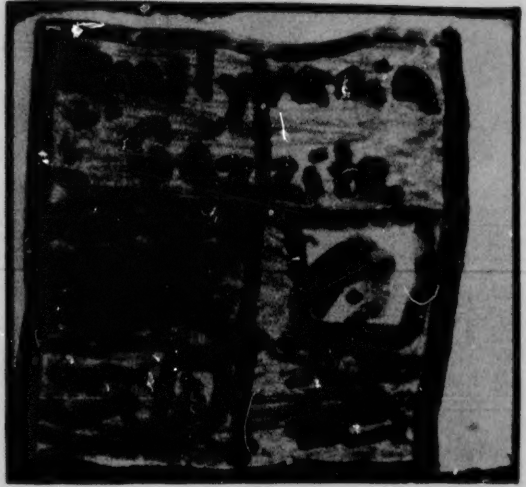
Our USMES sessions ended before the girls were able to complete their slide show, but they had done such a good



After a year, the Pilgrims came to the United States. The Pilgrims started another new town. Their new town was called Plymouth.



On July 4, 1776, the Declaration of Independence, written by Thomas Jefferson, was accepted. The Liberty Bell set up a glad ringing. A crowd gathered and listened while the Declaration was read.



Benjamin Franklin helped the people to get along together. He made a newspaper. Most of the people who came to America wanted to be free.

The Americans won the war. "We are free and independent," said the people. We have our own nation now and we've had it for 200 years.

Figure C2-6

job, I encouraged them to continue. They worked during free time and after school and had their seven-minute slide show ready for Open House where it was shown twice to very receptive audiences. Afterward they informed primary teachers that it would be kept in the media center for their use. (Four of the slides and the accompanying narration are shown in Figure C2-6.)

* * * * * * *

When our USMES sessions ended with the change of classes in mid-January, we all agreed that we had met our challenge. Everyone at Vista View was certainly aware of America's 200th birthday and all students at school were involved in some type of bicentennial activity. (Students' evaluation of their own work is shown in Figure C2-7.)

The Open House, which was devoted to the bicentennial and largely planned by our class, was a huge success. Because of our efforts, the school received the Minnesota Bicentennial Youth Certificate signed by the governor. We had it framed and the day after the Open House, at a school assembly, I presented it to the group leader of the All-School Projects who accepted it on behalf of all the students.

What I did accomplish: intercom about twice, scripts for play, practices, gave out parts for play, sign up sheet for intercom.

What I didn't accomplish: play.

I think our class accomplished pretty much of our goal. I really liked this class, it was fun.

Tiffany Daniel

We think it was the most funniest and interesting science class we've ever had! We had alot of fun making slides for the little kids and telling them about the bi-centennial. We also enjoyed making the story and tape recording it. We really had a good time at Mass Communications!!

Sue and Anne

I helped with the intercom and with the tapes on Wednesdays and with the posters and I know I didn't do that much cause I didn't like this class and well that's it.

John Forbord

We've done the survey on proposed amendments and the show case downstairs. We like this class because kids can decide what they want to do instead of the teacher always saying.

Mary and Kris

Figure C2-7

3. LOG ON MASS COMMUNICATIONS

by Bernard Walsh*
Hardy School, Grade 6
Arlington, Massachusetts
(January - June 1975)

ABSTRACT

This sixth-grade class worked for two or three hours each week on their campaign against vandalism. Because Mr. Walsh was not the regular classroom teacher, he had to schedule specific times for USMES sessions. The students first sponsored two poster campaigns within their own school. After conducting a survey to assess the effectiveness of the posters, the class decided that to reach a larger audience in the local community, they would expand their campaign by working in three groups. The P.A. Announcement Group read their messages over the school intercom and submitted one as an editorial message to a local television station. The Play Group wrote and performed a skit for the student body and for parents and made plans to have a videotape of it shown to other schools. After placing posters in various shops and public buildings, the Poster Group conducted on-the-street interviews. To gather more information about combating vandalism, the students invited people from the PTA, police department, school committee, and Town Meeting Council to speak with the class. Several students also researched for vandalism statistics at the local government offices, and the class then worked together to compile the data. As a result of their work with adults in the community the class was invited to send representatives to the high school student council, a town-wide meeting on vandalism, and the School Committee. At the end of the year the students agreed that the problem of vandalism was a long-term one that could not be quickly resolved. They felt, however, that they had at least helped other people to become more aware of the problem.

Because I was not a regular classroom teacher, I had to schedule specific USMES times to meet with the sixth-grade class. This imposed rigidity made the introduction of the Mass Communications challenge less spontaneous than it should have been and less natural than I would have preferred.

We spent the first several USMES meetings discussing forms of mass communication, such as television, radio, newspapers, tape recorders, and deciding on a topic or problem about which the students would like to inform many people.* Their list of suggestions was very long and included a variety of subjects which the children discussed and then narrowed to four. During a second ballot, the topic of vandalism received a majority of votes and that choice seemed to satisfy everyone.

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*Edited by USMES staff

I was curious as to why the students were so interested in vandalism. They explained that in the past several weeks television programs and local newspaper articles had focused on the destruction caused by vandals. They were also aware of several incidents of vandalism at our school, including damaged playground equipment and slashed tires on a teacher's car.

The students noted that before they could inform others about vandalism, they would need to obtain more information. They held a brief brainstorming session on sources of information, and then for the next two meetings the students brought in whatever data they could gather. For example, one boy tape-recorded an interview with his mother and several students talked with their neighbors who had been vandalized. We discussed the newspaper articles the children had collected and one in particular that described vandalism that had occurred at our high school. Later the students displayed the newspaper articles and the written accounts of their interviews on large construction paper so that the information would be readily available to everyone in the class. (See Figures C3-1 and C3-2.)

The vandalism really struck home during the last week in January. Two classrooms at our school were broken into at night and left in complete disarray. Several of the sixth graders accompanied me to the rooms to get a firsthand account of what had occurred from the teachers and the investigating police officer. One student even borrowed a camera from the school camera club and shot a whole roll of photos. (Unfortunately, the camera, or perhaps the student, was not operating correctly, and no photographs came out.)

The children were real detectives searching for clues. They discovered two different sizes of sneaker footprints and deduced that at least two children between the ages of nine and eleven had been in the classrooms. They learned from the custodian that the vandalism could have occurred

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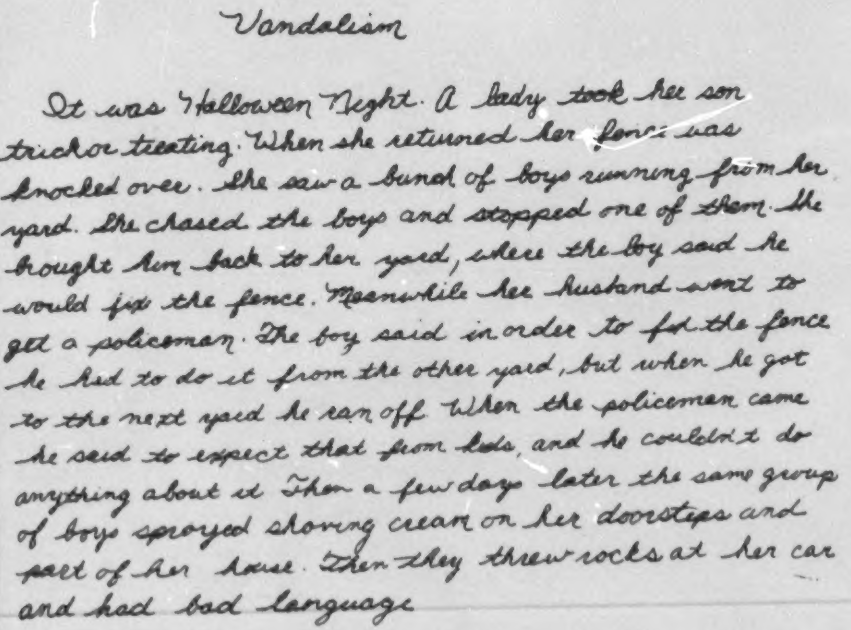
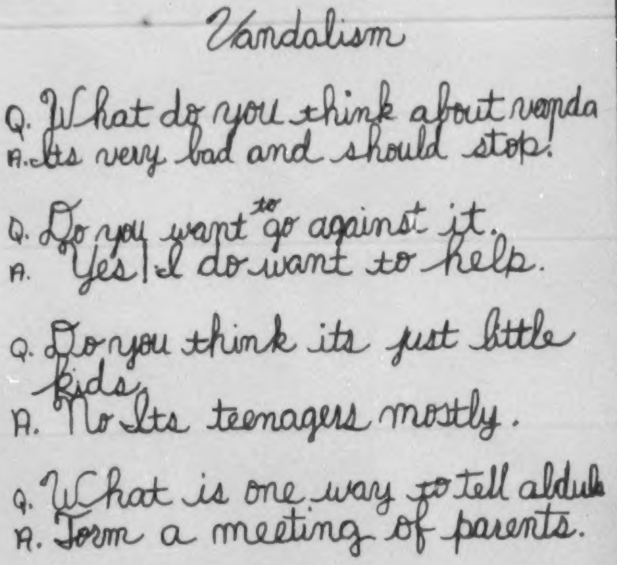
*In other classes the challenge to tell others about a problem might be introduced after a specific problem naturally arises and the children decide that one way to remedy the problem is to tell other people about it.--ED.



Vandalism

It was Halloween Night. A lady took her son trickor treating. When she returned her fence was knocked over. She saw a bunch of boys running from her yard. She chased the boys and stopped one of them. She brought him back to her yard, where the boy said he would fix the fence. Meanwhile her husband went to get a policeman. The boy said in order to fix the fence he had to do it from the other yard, but when he got to the next yard he ran off When the policeman came he said to expect that from kids, and he couldn't do anything about it Then a few days later the same group of boys sprayed shaving cream on her doorsteps and part of her house. Then they threw rocks at her car and had bad language

Figure C3-1



Vandalism

Q. What do you think about vanda
A. Its very bad and should stop!

Q. Do you want to go against it.
A. Yes I do want to help.

Q. Do you think its just little kids.
A. No Its teenagers mostly.

Q. What is one way to tell aldults
A. Form a meeting of parents.

Figure C3-2

only during a Cub Scout meeting held the previous evening because that was the only time the burglar alarm was not turned on.

These students and I later met with the Scout Master to discuss the break-in. He seemed rather surprised at all the information the students had gathered and also upset that probably one or more of his troop members were the culprits. This was the second such incident that had occurred during one of his meetings, but thanks to his cooperation, it was also the last.

To interest their schoolmates in our campaign against vandalism, some of the children started drawing posters to place around school. Those students who had suggested trying several different communications methods were persuaded to wait to see what effect the poster campaign would have.

When several posters were completed, the class carefully examined them and discussed how other people might view them. The students noted that using color made the posters more noticeable. One child mentioned that the younger children in kindergarten and first grade might have difficulty reading the words. Another student added that this would also be a problem for his parents who did not speak or read English. We concurred that the pictures on the posters should ideally be detailed enough to explain our message without words.

The students worked for several more sessions on the posters and then met to discuss where to place them. They agreed that the best locations would be where most children would see them, for example, in the halls by the stairways, lunchroom, and main office. They decided that no announcement would be made about the posters which would later help them determine how many people had actually noticed them.

That afternoon the class divided into three teams, one per floor, to hang the posters in selected areas. At our next meeting the groups reported on the locations, and then we considered how to conduct a survey to assess whether the posters were noticed.

The children decided that the simplest method would be to ask their questions orally (Did you notice our posters? What was the message?) and to tally the affirmative and negative responses. They decided that five survey groups were needed to visit all the classrooms and to inverview the school staff, including the office personnel, custodians, lunch mothers, and special teachers. Each survey group was composed of two students, a tallier, who counted how many people had noticed the posters, and a checker, who recorded the data.

The survey groups later reported that the following number of people had noticed the posters*:

Grade		Yes
Kindergarten		only teachers
Grade 1	Room 1	7
	Room 2	only teacher
	Room 3	5
Grade 2	Room 4	18
	Room 6	13
	Room 7	15
Grades 3,4	Room 12	19
	Room 13	5
	Room 15	3
	Room 16	4
Grade 5	Room 8	13
	Room 9	14
	Room 10	20
Grade 6	Room 25	7
	Room 28	15

The teams visiting the kindergarten and first grade classes noted that although some of the younger children had seen the posters, they had not understood the purpose because they could not read the words. One of the teachers had mentioned that even if someone had read the posters to the younger children, they probably would not have understood the meaning of vandalism. We agreed that a special set of posters was needed for this age group.

Later the students further evaluated each other's drawings for clarity and action expressed and then completed a second set of posters which they again placed in high traffic areas around the school. After several days they conducted another survey on which there were many more affirmative responses. We found that the first survey had drawn attention to our campaign against vandalism and that many children had started to look for our posters.

With the two school-wide poster campaigns completed, we met to decide our next course of action. The children realized that so far their campaign had been directed toward their schoolmates, but they felt that many people responsible for vandalism were in other parts of the community. Therefore, they focused on communications methods to use in reaching a larger audience, one outside our school. After listing and discussing various suggestions, the students decided to concentrate initially on three areas:

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*The students might calculate the percentage of children in each grade level who answered yes and then construct a histogram to show clearly this information.--ED.

1. posters to place in stores
2. intercom announcements, choosing one to submit as a television editorial
3. skit to perform for our student body and guests and for other schools.

We also resolved what some students saw as competition from another class who intended to include articles about vandalism in their new school newspaper. Some of my students were upset and angry and complained that their ideas were being taken away. I suggested that both classes could work together on those particular articles, and after some thought, the students decided that it might be a good opportunity to share ideas. (See Figure C3-3 for articles about our class activities that later appeared in the school newspaper.)

For the next several sessions, the students worked on preliminary planning in their three groups. At the start of each meeting the groups briefly reported to the class on their progress. These discussions brought out the fact that the children needed additional information about vandalism. For example, the Poster Group wanted some of their posters to include graphs showing the rising rate of vandalism to houses, stores, cars, parks, and gardens. To obtain the needed information, the children began to visit local government agencies after school and also to invite people from the PTA, police department, school committee, and Town Meeting Council to our class for interviews.

For several weeks our group work was interspersed with interviewing these visitors, who discussed the problems of vandalism and what could be done to prevent it. Everyone who came was very cooperative and provided a big boost to the children's enthusiasm. They also offered some good suggestions on how the class could find more data and how they could involve more people in the community in their campaign. Interviews with three of our five guests are briefly described below.

The chairperson of the School Committee suggested that the children make sure that copies of their information were brought before her committee, that the class play be videotaped to show in other schools, and that a point be made of involving parents. The head of the safety unit for the police department told the students where they might

Vandelism

Mrs. Whites class is doing a project in Vandalism. MR. Walsh is also helping them.

There are many signs all around the school.

They hope this project works

Good Luck!

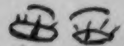
+  Look and Listen for Vandalism

Figure C3-3

More about Vandalism

BY Maria Tzevelecakis

Mrs. Whites class (RM.27) has information on the rate of Vandalism. They got it from the Arlington police.

The reason people dont report Vandalism is: If the class puts posters up, the people who commit Vandalism might break the windows with the posters on them.

Mrs. White's class has called on the Speak Out Messages and asked if they could go on and talk about Vandalism.

Also going on is the Vandalism song. I've heard it and my opinion on it is "I think Its great!"

On March 4th MRS. O'Brien came and met with the Kids.

How did she get involved?

She's been getting notes from the police, judges and the Consultation Center

1.	Senior High	601
2.	Stratton	327
3.	Locke	271
4.	Crosby	216
5.	Bishop	202
6.	Hardy	194
7.	Brackett	187
8.	Cutter	129
9.	Peirce	103
10.	Parmenter	68
11.	Thompson	63
12.	Dallin	55
13.	Jr. High West	47
14.	Central	36
15.	Jr. High East	16
	Total	2,504

Figure C3-4

locate exact data. He especially encouraged them to use the local newspaper and television stations to get other people involved. The officer later informed the assistant superintendent of schools about our activities which resulted in an invitation to meet with the high school student council at a later date.

Our interview with a member of the PTA Executive Board produced some interesting results because she was also chairperson of a community campaign against vandalism. One group of children reported on the total annual tally of vandalism cases, plus a month-by-month breakdown which they had obtained from the town clerk. Our visitor was very interested because she had been trying to find some of this data. She and the children agreed that the amount of time required just to locate information on vandalism in our community was a major problem. Because different government offices were in charge of separate records, it was necessary to travel from one town agency to another and to search through the files. She invited some of the children to help her search for additional data at the Town Hall, and the students readily accepted.

Later the chairperson of the town-wide campaign against vandalism, three students, and I visited the Town Hall to gather whatever information we could about vandalism. We soon realized that it would take a great deal of searching, but we were able to make some progress. We found the number of reported cases of vandalism in each school for a ten-month period, and we were able to obtain on loan almost fifty photographs of vandalism in all the schools. The children also checked with the cemetery department and received a count of the number of gravestones damaged.

When we met with the class, the children reported on the trip and the information collected. The students felt that they would be able to use some of the data for the graphs on their posters.

Two students used the weekly figures on repairs to tally the number of broken windows at each school during the past year. We displayed the numbers on the board and the class ranked them from highest to lowest number of windows broken. Out of fifteen schools, our own was sixth with 194 broken windows. (See Figure C3-4.)

We discussed why some schools had more breakages than others. The children felt that the senior high school ranked in first place because older children attended classes there and because it was a very large building and, consequently, had more panes of glass which could be broken. We were all surprised that both junior highs were in low positions. The children noted that the economical standing of the surrounding neighborhood seemed to have little bearing on the number of broken windows; some of the schools in poorer areas had fewer breaks. As we further analyzed the data, the students recognized that these figures did not necessarily represent acts of vandalism. The children felt that many of the breaks could have occurred accidentally.

During our discussion one of the girls had used the class adding machine to find the total cost of replacing windows at all the schools. She wrote the following figures on the board:

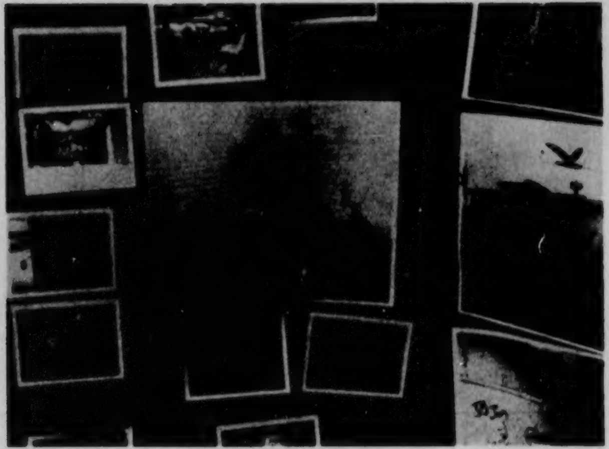
cost of materials - $10,655.96
cost of labor - 17,656.59
total - $28,312.55

Everyone was astonished at the cost, especially the charges for labor.

The children were curious to find out whether there were any seasonal differences for the number of broken windows. We used our own school as an example and found that out of a yearly total of 194 breaks, 61 had occurred during the two and a half months of summer vacation versus 133 breaks during the school year. The children felt that this meant that more vandalism occurred during the school year.*

The following day a group of students met with the high school student council to explain their activities and to share their information and pictures. The older students said that they, too, had been trying to deal with vandalism problems, but so far they had had little or no response from the town officials. They were, however, planning to attend the city conference on vandalism, and they asked our class to be sure to participate by making a presentation of their findings.

With their interviews completed and their information collected, the class made several decisions about their future activities. They decided to display the photographs on a three-panel folding screen so that all the students in our school could easily see them. They also decided to finish up their group work as soon as possible. Each group's activities are described in the following paragraphs.



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*If the children had figured the percentage of breaks during the summer, they might have realized that the sixty-one breaks represents an increase rather than a decrease. They could have used these figures to support their suggestion to the School Committee that the schools remain open for public use during the summer months.--ED.

C
Money. Money, Money, Money
G7
Goes quickly down the drain,
C
Vandals. Vandals. Vandals, Vandals
G7 C
Stopped by the cops again

C
Damage. Damage, Damage, Damage
G7
Goes on, and on, and on
C
We will try to stop it now
G7 C
Before our time is gone

Figure C3-5

Play Group

The Play Group had encountered some difficulties with members who did not always attend their planning meetings, but by the first of March, they had worked out their problems and completed their script for "Vandalism Does Not Pay." The central characters were a gang of young vandals who were always causing trouble in their neighborhood. One of the members, Waldo, went along with the gang only because he was dared to by the others, but he never caused damage. Eventually the gang was caught by the police and a court scene followed. One of the vandals confessed to the judge, and all, except Waldo, were sent to reform school. The first two drafts had been evaluated by the other students in class who suggested that there be longer scenes, less change of scenery, and more dialogue with less use of slang.

Once the script was revised and the group was satisfied with the changes, copies were dittoed for the fourteen actors and a student director. The children set dates for their rehearsals and for the school performance. One group of children volunteered to work in the Design Lab to make the stage scenery, which included Tri-Wall bushes, a house facade with a door, and a jury box. I was very proud that many of the activities of this group were initiated entirely by the children as they saw a need for them.

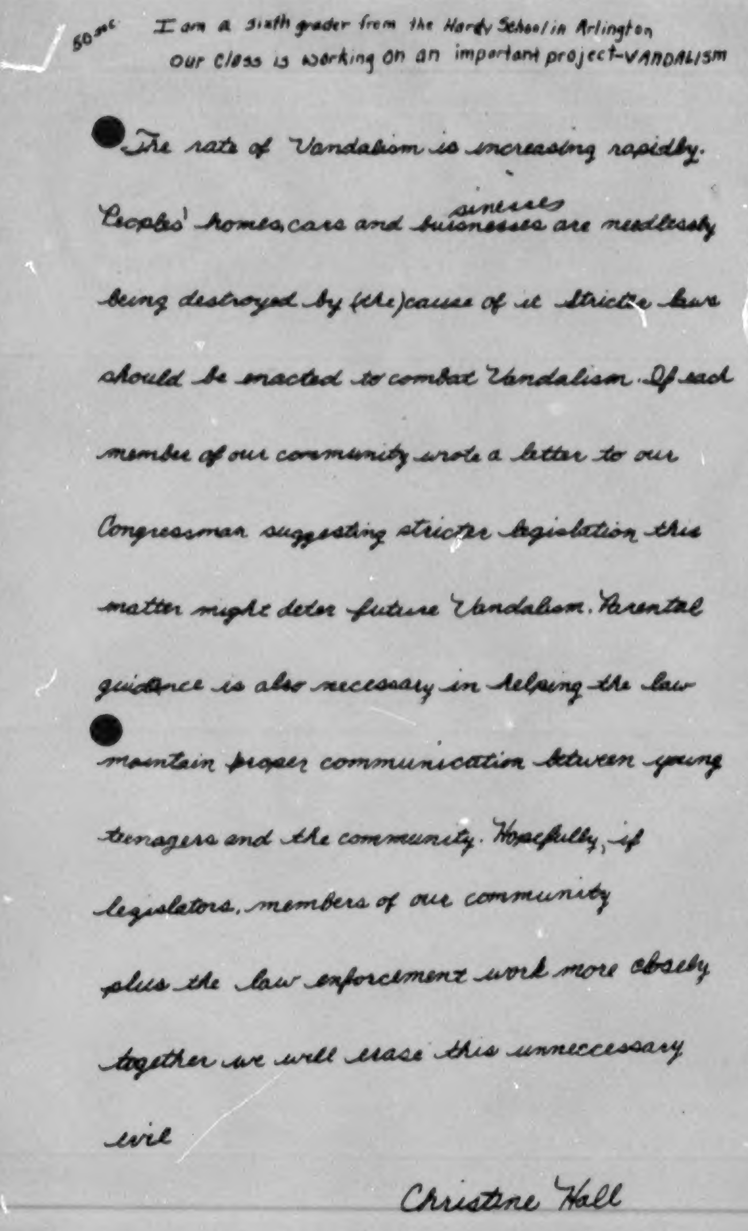
To accommodate the entire student body and visitors, the students gave two performances of their play on April 1. We had previously arranged to have the skit videotaped so that we could show it to other schools in the district. Several girls had composed an original song with guitar accompaniment which the entire class sang at the close of the play. (See first stanza of lyrics in Figure C3-5.)

Both performances went very well, and the audiences were very responsive. The students were especially pleased with congratulatory notes sent by three other classes and with the many favorable comments from their schoolmates.

Announcement Group

Members of this group also spent part of their language arts periods working on their intercom announcements with their regular classroom teacher. The students decided that their messages should be brief, have appeal for all age groups, and relate some incident that had occurred at school or in the community. They rejected one child's suggestion to broadcast the names of suspected vandals, fearing that this might create more bad response than good.

When the first drafts of the announcements were completed, the group met to review them. One of the boys had followed through on one of the original ideas of the class by tele-



some I am a sixth grader from the Hardy School in Arlington
our class is working on an important project-VANDALISM

The rate of Vandalism is increasing rapidly. Peoples' homes, cars and businesses are needlessly being destroyed by (the) cause of it. Stricter laws should be enacted to combat Vandalism. If each member of our community wrote a letter to our Congressman suggesting stricter legislation this matter might deter future Vandalism. Parental guidance is also necessary in helping the law maintain proper communication between young teenagers and the community. Hopefully, if legislators, members of our community plus the law enforcement work more closely together we will erase this unneccessary evil

Christine Hall

Figure C3-6

phoning the local television station to find out the guidelines for submitting an editorial message. He reported that comments were limited to fifty seconds and could not contain partisan political statements. The second requirement posed no difficulty for the group, but the children were uncertain whether they were complying with the time limit. They used a stopwatch to time their scripts and found that four were too short and one was six seconds too long.

The messages were revised and then evaluated and timed by group members. The students also wrote a brief introduction to identify themselves and their project. A great discussion followed on how to select one message to submit to the television station. Finally, the group agreed that each person would anonymously read his/her announcement on the intercom and then the teachers would vote for the best one.

The group followed through with this plan and the message shown in Figure C3-6 received the greatest number of votes from the teachers. Although the message was neatly copied and submitted to the television station, we had no response from the editorial selection committee. One boy telephoned many times to try to find out whether our message would be used but was never able to speak with anyone besides a secretary who provided no information.

Poster Group

The Poster Group decided that they would prefer to display different posters rather than making multiple copies of one design, which they felt might be boring. Several students worked together to make a bar graph of the vandalism statistics that we had gathered (see Figure C3-7). A few posters had been completed when the students decided that before proceeding further, they should determine exactly how many posters they would need.

Consequently, while the class continued to work in groups, I accompanied six members of the Poster Group to visit nearby merchants to find out whether they would be interested in displaying our posters. The children decided that this would also be a good opportunity to interview the businessmen about their feelings towards vandalism, and so they prepared the following list of questions:

1. Have you ever had problems with vandalism, and if so, would you tell us about them?
2. What did the police do when you reported it?
3. Did they catch the vandals and what happened to them if they did?

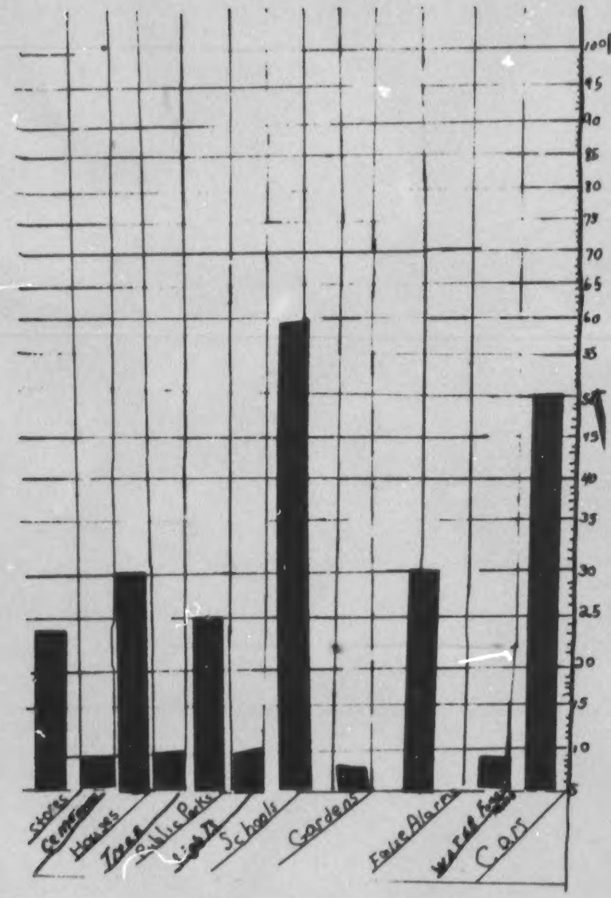


Figure C3-7

4. What age are the vandals who do most of the damage?
5. Every time there is a case of vandalism, does it cost you more in insurance?

We walked to the nearby business district, and the children worked in pairs; one child asked the questions and the other took notes. When they went to the next store, they reversed what they had done so that everyone had the opportunity to ask questions. I observed the children's interviews and noted that, in a few instances, the merchants seemed rather taken aback by what the children were trying to accomplish and put them off by saying they were too busy to talk. In most stores the children were received favorably and they handled themselves well. They were very polite but also very nervous.

When ten interviews had been completed, we returned to school. The children discussed the information and prepared a report for the class. They mentioned that because they had not been in the stores to buy anything, it was difficult to talk with the managers because of constant interruptions from customers. Most merchants appeared to be interested in the children's activities, but some were also afraid; more than one had requested that his/her name not be used if the information was to appear in the newspapers. One woman refused our request to display a poster because she thought it might provoke vandals to attack her store. However, eight out of ten merchants did agree to display the class's posters.

After the Poster Group's report, someone mentioned that we should also consider other locations besides the eight stores. Everyone agreed with one student's suggestion that we choose "a place where a lot of people go and it's not cluttered." As we listed various sites, such as libraries, supermarkets, movie theaters, churches, post offices, and recreational buildings, the children volunteered to ask for permission to place our signs in those buildings.

One boy reported on an interview he had already conducted with the head librarian at the public library. Not only did she agree to place a poster on the main bulletin board, but she also offered to show the videotape of our play to a children's group that regularly met on Saturday mornings.

The Poster Group kept a count of the number of locations and then prepared the needed number of posters. The children felt quite successful with the poster placement since most people readily agreed to display them.

* * * * *

Many of our USMES activities were delayed during the remainder of April because of spring vacation and other school activities. Early in May we had guests from the office of the Town Manager who came to learn more about the class's campaign against vandalism and to tell us more about the forthcoming city conference on vandalism. The children made a good persentation, and I was very proud of the way they were able to respond to the questions and to present their data in a logical manner. Among their observations and recommendations were the following:

1. Often adults don't take children seriously. They feel that children don't understand the vandalism problem and so can't do anything about it.
2. Many adults are afraid to deal with the vandalism problem because they are afraid vandals will retaliate by attacking their property.
3. Vandalism occurs in all neighborhoods, regardless of the income level.
4. The schools should belong to the community and not be closed up at the end of the school day. They could be used for adult education classes and programs for children.
5. There should be a program whereby vandals who are caught would work in the schools to help repair the damage or to help the school in other areas, such as in the Design Lab or as teacher aides.
6. There should be more communication between adults (parents, teachers, town officials) and students. More pride has to be built into the teaching of children, starting at home and carrying over into the school.

Our guests seemed impressed with the children's findings and observations. They issued a formal invitation for a group of our students to present their information at the town-wide conference on vandalism which was held two days later.

I accompanied three of our students to the conference. They were a little nervous at the thought of speaking before representatives of all the town agencies, both civic and governmental, but I felt they could handle the situation. When their turn came to make their presentation, they repeated many of the recommendations they had given to the conference members who visited our class. In addition, they suggested that their own activities might be used to show teachers and students at other schools what children can do about the problem. Again the students were well received, and they were asked to show the videotape of their play at a future meeting of the conference. They were also issued another invitation to give their presentation, along with the high school students, to the School Committee.

At our next class meeting, the three students reported on the conference. They brought in a statistics sheet on vandalism that had been distributed at the meeting, and the class discussed the data. They saw that since 1973 the rate of vandalism had been steadily increasing and that most of the vandals who were apprehended were given only a warning (for example, in 1973 and 1974, out of 225 apprehended vandals, only 24 cases went to court). They also noted that there was very little restitution by the vandals who were caught. The children felt that these statistics proved what they had learned from their research.

The three students also reviewed other items discussed at the meeting. Quite a bit of time had been spent defining vandalism and distinguishing deliberate from nonmalicious vandalism. In summary, they added that the class had found much of the same information as the committee had found. They generally agreed that the vandalism problem could be dealt with by the schools with the help of the parents and the general public.

The class spent the next session preparing for the presentation to the School Committee. Our four student representatives were concerned about what information to report. Some of the children suggested that certain things might be avoided. For example, no particular group of people should be blamed for vandalism. They explained that in talking to the high school students, many had said that sometimes the police questioned vandals, gave them only a warning, and then let them go with no punishment. My students felt that if the police were blamed, we wouldn't get their cooperation in solving the problem. Someone else said that the names of suspected vandals should not be used because, without proof, this would be a very serious charge. The children agreed that they should be very careful to give exact data, especially because the press would be attending the meeting and might possibly publish our findings.

The students' presentation before the School Committee was very good. The high school representatives, who spoke first, acknowledged that they had more of a personal reaction whereas our class had collected substantial data. My students presented their information, including some of the data we had analyzed from the town-wide meeting on vandalism, and they passed around their posters and photographs. Several committee members were curious as to why some of the data gathered by the children had not been previously made available to them.

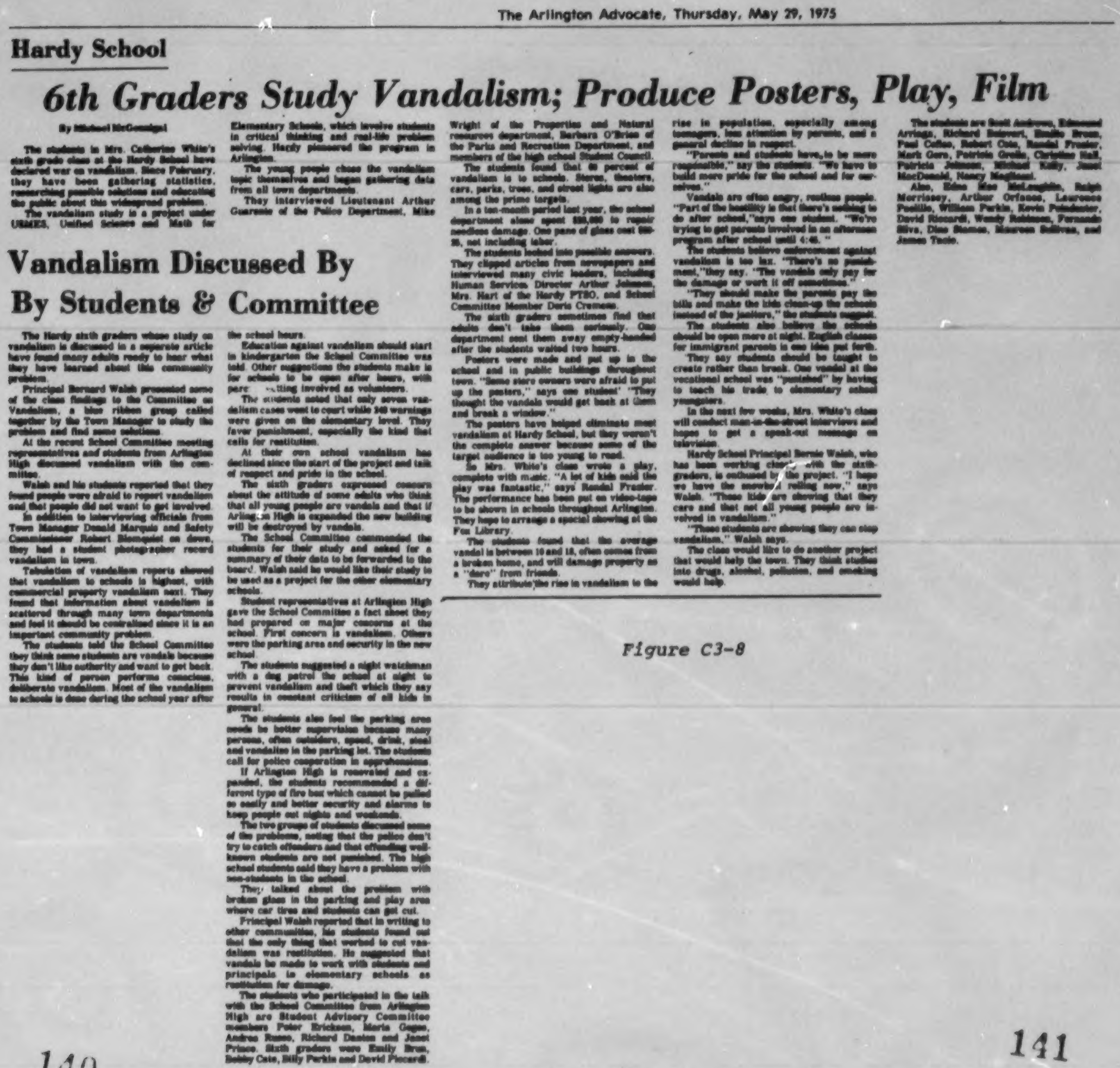
Several days later two newspaper articles in the *Arlington Advocate* focused on our class presentations (see Figure C3-8). A reporter had attended the city-wide conference and the School Committee meeting and had also interviewed our class. It was really an excellent session because the reporter asked questions that made the students really think about what they had been doing. Before leaving, he asked whether the students felt that their activities had been a good way to learn. There was unamimous agreement that a great deal of learning had taken place and that they would be interested in doing another Mass Communications unit.

During a later class meeting, we reviewed the videotape of our play along with several observers from the Town Manager's Office who came to help us evaluate it. After the showing, the children made the following suggestions:

1. Make an introduction to the tape explaining how the class became involved in the project.
2. Show the tape to a kindergarten class to see if the younger children could understand it.
3. Show the tape to a sixth-grade class at another school to get the students' reactions.

We agreed that some parts of the tape were not as good as we would have liked. The laughter and applause of the audience had drowned out some crucial lines, in particular the last one where the vandals stepped forward and said, "We learned the hard way that vandalism does not pay."

Our visitors said that the play was good. However, they added they would like to see a more positive sequel to the videotape so that rather than having the young vandals to to reform school, they would be involved in constructive activities (e.g., show the vandals helping teachers and children at school and repairing damage). The children



Hardy School

6th Graders Study Vandalism; Produce Posters, Play, Film

By Michael McGonnigal

The students in Mrs. Catherine White's sixth grade class at the Hardy School have declared war on vandalism. Since February, they have been gathering statistics, researching possible solutions and educating the public about this widespread problem.

The vandalism study is a project under USMES, Unified Science and Math for Elementary Schools, which involve students in critical thinking and real-life problem solving. Hardy pioneered the program in Arlington.

The young people chose the vandalism topic themselves and began gathering data from all town departments.

They interviewed Lieutenant Arthur Guarente of the Police Department, Mike Wright of the Properties and Natural resources department, Barbara O'Brien of the Parks and Recreation Department, and members of the high school Student Council.

The students found that 80 percent of vandalism is to schools. Stores, theaters, cars, parks, trees, and street lights are also among the prime targets.

In a ten-month period last year, the school department alone spent $30,000 to repair needless damage. One pane of glass cost $80-35, not including labor.

The students looked into possible answers. They clipped articles from newspapers and interviewed many civic leaders, including Human Services Director Arthur Johnson, Mrs. Hart of the Hardy PTSO, and School Committee Member Doris Cremens.

The sixth graders sometimes find that adults don't take them seriously. One department sent them away empty-handed after the students waited two hours.

Posters were made and put up in the school and in public buildings throughout town. "Some store owners were afraid to put up the posters," says one student. "They thought the vandals would get back at them and break a window."

The posters have helped eliminate most vandalism at Hardy School, but they weren't the complete answer because some of the target audience is too young to read.

So Mrs. White's class wrote a play, complete with music. "A lot of kids said the play was fantastic," says Randal Frazier. The performance has been put on video-tape to be shown in schools throughout Arlington. They hope to arrange a special showing at the Fox Library.

The students found that the average vandal is between 10 and 18, often comes from a broken home, and will damage property on a "dare" from friends.

They attribute the rise in vandalism to the rise in population, especially among teenagers, less attention by parents, and a general decline in respect.

"Parents and students have to be more responsible," say the students. "We have to build more pride for the school and for ourselves."

Vandals are often angry, restless people. "Part of the hostility is that there's nothing to do after school," says one student. "We're trying to get parents involved in an afternoon program after school until 4:45."

The students believe enforcement against vandalism is too lax. "There's no punishment," they say. "The vandals only pay for the damage or work it off sometimes."

"They should make the parents pay the bills and make the kids clean-up the schools instead of the janitors," the students suggest.

The students also believe the schools should be open more at night. English classes for immigrant parents is one idea put forth.

They say students should be taught to create rather than break. One vandal at the vocational school was "punished" by having to teach his trade to elementary school youngsters.

In the next few weeks, Mrs. White's class will conduct man-in-the-street interviews and hopes to get a speak-out message on television.

Hardy School Principal Bernie Walsh, who has been working closely with the sixth-graders, is enthused by the project. "I hope we have the snowball rolling now," says Walsh. "These kids are showing that they care and that not all young people are involved in vandalism."

"These students are showing they can stop vandalism," Walsh says.

The class would like to do another project that would help the town. They think studies into drugs, alcohol, pollution, and smoking would help.

The students are Scott Andrews, Edmund Arriaga, Richard Bateman, Emilie Brun, Paul Coffee, Robert Cote, Randal Frazier, Mark Gore, Patricia Grella, Christine Hall, Patricia Johnson, Michael Kelly, Janet MacDonald, Nancy Magliozzi.

Also, Edna Mae McLaughlin, Ralph Morrissey, Arthur Orfanos, Laurence Paolillo, William Perkis, Kevin Poindexter, David Riccardi, Wendy Robinson, Fernando Silva, Dino Stamos, Maureen Sullivan, and James Tocio.

Vandalism Discussed By By Students & Committee

The Hardy sixth graders whose study on vandalism is discussed in a separate article have found many adults ready to hear what they have learned about this community problem.

Principal Bernard Walsh presented some of the class findings to the Committee on Vandalism, a blue ribbon group called together by the Town Manager to study the problem and find some solutions.

At the recent School Committee meeting representatives and students from Arlington High discussed vandalism with the committee.

Walsh and his students reported that they found people were afraid to report vandalism and that people did not want to get involved.

In addition to interviewing officials from Town Manager Donald Marquis and Safety Commissioner Robert Blomquist on down, they had a student photographer record vandalism in town.

Tabulation of vandalism reports showed that vandalism to schools is highest, with commercial property vandalism next. They found that information about vandalism is scattered through many town departments and feel it should be centralized since it is an important community problem.

The students told the School Committee they think some students are vandals because they don't like authority and want to get back. This kind of person performs conscious, deliberate vandalism. Most of the vandalism to schools is done during the school year after the school hours.

Education against vandalism should start in kindergarten the School Committee was told. Other suggestions the students make is for schools to be open after hours, with pare ·· tting involved as volunteers.

The students noted that only seven vandalism cases went to court while 340 warnings were given on the elementary level. They favor punishment, especially the kind that calls for restitution.

At their own school vandalism has declined since the start of the project and talk of respect and pride in the school.

The sixth graders expressed concern about the attitude of some adults who think that all young people are vandals and that if Arlington High is expanded the new building will be destroyed by vandals.

The School Committee commended the students for their study and asked for a summary of their data to be forwarded to the board. Walsh said he would like their study to be used as a project for the other elementary schools.

Student representatives at Arlington High gave the School Committee a fact sheet they had prepared on major concerns at the school. First concern is vandalism. Others were the parking area and security in the new school.

The students suggested a night watchman with a dog patrol the school at night to prevent vandalism and theft which they say results in constant criticism of all kids in general.

The students also feel the parking area needs be better supervision because many persons, often outsiders, speed, drink, steal and vandalize in the parking lot. The students call for police cooperation in apprehensions.

If Arlington High is renovated and expanded, the students recommended a different type of fire box which cannot be pulled so easily and better security and alarms to keep people out nights and weekends.

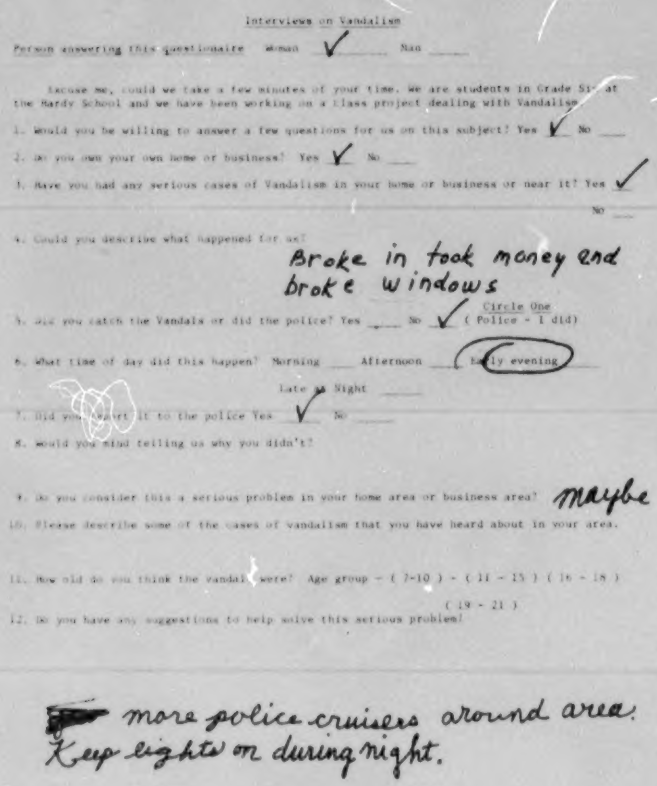
The two groups of students discussed some of the problems, noting that the police don't try to catch offenders and that offending well-known students are not punished. The high school students said they have a problem with non-students in the school.

They talked about the problem with broken glass in the parking and play area where car tires and students can get cut.

Principal Walsh reported that in writing to other communities, his students found out that the only thing that worked to cut vandalism was restitution. He suggested that vandals be made to work with students and principals in elementary schools as restitution for damage.

The students who participated in the talk with the School Committee from Arlington High are Student Advisory Committee members Peter Erickson, Marie Gagne, Andrea Russo, Richard Deaton and Janet Prince. Sixth graders were Emily Brun, Bobby Cote, Billy Perkis and David Riccardi.

Figure C3-8



Interviews on Vandalism

Person answering this questionnaire Woman ✓ Man ___

Excuse me, could we take a few minutes of your time. We are students in Grade Six at the Hardy School and we have been working on a class project dealing with Vandalism.

1. Would you be willing to answer a few questions for us on this subject? Yes ✓ No ___
2. Do you own your own home or business? Yes ✓ No ___
3. Have you had any serious cases of Vandalism in your home or business or near it? Yes ✓ No ___
4. Could you describe what happened for us?
   Broke in took money and broke windows
5. Did you catch the Vandals or did the police? Yes ___ No ✓ Circle One (Police - I did)
6. What time of day did this happen? Morning ___ Afternoon ___ [✓ Early evening] ___ Late at Night ___
7. Did you report it to the police Yes ✓ No ___
8. Would you mind telling us why you didn't?
9. Do you consider this a serious problem in your home area or business area? maybe
10. Please describe some of the cases of vandalism that you have heard about in your area.
11. How old do you think the vandals were? Age group - (7-10) - (11 - 15) (16 - 18) (19 - 21)
12. Do you have any suggestions to help solve this serious problem?

more police cruisers around area. Keep lights on during night.

Figure C3-9

accepted the criticism well and agreed to discuss it further.

Although the students could see the point raised by our visitors, the initial reaction at our next session was to defend their play. They felt that by showing the vandals' disrespect of property, adults, and even the court system, they were depicting reality. They finally agreed that a sequel could be made to show things the way they should be. However, our school year was nearing an end and there was little time left to produce a follow-up to the skit. The children suggested that since they would be entering junior high in the fall, they could try to interest an upcoming sixth-grade class in continuing our campaign against vandalism. They also decided that when the play was performed for parents at the end of May, the announcer would inform everyone that a sequel might be added.

With very little time remaining before summer holidays began, we still had one major task to complete. When the children had originally placed their posters in local stores, they had decided to conduct follow-up surveys to find out how much attention they had attracted. However, as we began discussing format, the questionnaire, rather than being an evaluation of our use of posters, turned into an opinion survey of how people felt about vandalism (see Figure C3-9). The children also wanted to compare people's reactions to interviews conducted with anonymous questionnaires versus interviews with tape recorders and videotapes.

The children conducted the interviews over a two-day period. Unfortunately, the tape recorder group had technical difficulties and was unable to participate. I accompanied the children to a nearby business area and then they were on their own. We picked a time limit of fifteen minutes and a meeting place where I waited and was available for assistance if they needed me.

The children really did a good job. They later commented that at first they had been a little afraid to stop people on the street, but they had found that most people were very cooperative. One student interviewed a woman who asked him more questions about what he was doing than he was able to ask her about vandalism.

We were able to have the second set of interviews videotaped, and the children noticed quite a difference in people's reactions. Many people deliberately walked out of our shooting range, and others avoided looking at the camera. Quite a few people who were stopped wouldn't be interviewed until they were sure that the tape wouldn't be shown on television. We also had more refusals with ex-

	Men Yes	Men No	Men No Response		Women Yes	Women No	Women No Response	
1)	6	1			19	0	1	
2)	[illegible]	4			8	13		
3)	1	5	1		3	17		
4)	Spray paint	eggs			stealing broken windows breaking & entering - gas cap stolen			
5)	1	2	4		2	5	8	
6)	Afternoon 1	Morn. 5	Late P.M. 1		A.M. 1	Aft. 1	Late Aft. 4	late P.M. 1
7)	2		5		4	3	11	
8)	0	0	0		0	0		
9)	2	3	2		9	5		
10)	0 7-10	3 11-15	4 16-18	0 19-21	0 7-10	10 11-15	7 16-18	3 19-21
11)	more youthcenters provide activities				more protection police patrol in evening police cooperation with lights Have respect More parental control More involvement Stronger laws			

10 was no response

Figure C3-10

cuses from the people that they were too busy to stop or that they didn't know anything about vandalism.

The two interview groups brought their information back to class and together we compiled the data according to male and female responses.* (See Figure C3-10.) Some of the questions had not been answered by all the people interviewed, but the students were still able to make some generalizations. Most of the people seemed to feel that punishment for vandals was not severe enough and that some vandalism could be eliminated by providing more activities for youths. Adults felt that children between eleven and eighteen years of age accounted for most of the vandalism.

The class decided to add several of the videotaped interviews to the tape of the play. I told the students that I had already informed the other elementary principals that the class videotape would be available in the fall to show to their students. One student reported that he had talked with a sixth-grade teacher who agreed to work with her class in the fall to add a sequel to our videotape. We were quite pleased that someone would be following through with our plans.

At our final session the students reviewed their activities and evaluated their campaign against vandalism. We agreed that not only we but also the general public and the town officials had learned a great deal about vandalism because of the class's involvement.

The students realized, however, that they had made only a start towards solving the problem of vandalism, but they did feel that they had perhaps increased many people's awareness of the problem. I pointed out that, at least in our own school, the rate of vandalism had diminished since their campaign had started.

I was really pleased with what the class had been able to accomplish in a relatively short period of time. The students carried over much of what they had learned to social studies and language arts. Both the regular classroom teacher and I felt that striving towards a common goal had helped to draw the class closer together.

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*The children might calculate the percentage of yes answers to the most important questions and then show the results on a bar graph. They might also graph the data on the number of occurrences of vandalism during different times of day.--ED.

D. References

1. LISTS OF "HOW TO" SERIES

The *USMES "How To" Series* are written resources that help children learn skills they need to solve real problems (e.g., designing an opinion survey, drawing various types of graph).

"HOW TO" CARDS

Below are listed the current "How To" Card titles that students working on the Mass Communications challenge may find useful. A complete listing of both the "How To" Cards and the Design Lab "How To" Cards is contained in the USMES Guide. In addition, the Design Lab Manual contains the list of Design Lab "How To" Cards.

GRAPHING	GR 1	How to Make a Bar Graph Picture of Your Data
	GR 2	How to Show the Differences in Many Measurements of the Same Thing by Making a Histogram
	GR 3	How to Make a Line Graph Picture of Your Data
	GR 4	How to Decide Whether to Make a Bar Graph Picture or Line Graph Picture of Your Data
	GR 5	How to Find Out If There is Any Relationship Between Two Things by Making a Scatter Graph
	GR 7	How to Show Several Sets of Data on One Graph
MEASURING	M 1	How to Use a Stopwatch
	M 2	How to Measure Distances
	M 9	How to Make a Conversion Graph to Use in Changing Measurements from One Unit to Another Unit
	M 10	How to Use a Conversion Graph to Change *Any* Measurement in One Unit to Another Unit
PROBABILITY AND STATISTICS	PS 2	How to Record Data by Tallying
	PS 3	How to Describe Your Set of Data by Finding the Average
	PS 4	How to Describe Your Set of Data by Using the Middle Piece (Median)
	PS 5	How to Find the Median of a Set of Data from a Histogram
RATIOS, PROPORTIONS, AND SCALING	R 1	How to Compare Fractions or Ratios by Making a Triangle Diagram*
	R 2	How to Make a Drawing to Scale
	R 3	How to Make Scale Drawings Bigger or Smaller

*Now called slope diagram

BEGINNING "HOW TO" SERIES

The cartoon-style format of this series helps younger children and those with reading difficulties acquire the skills and knowledge they may need during work on Mass Communications.

COLLECTING DATA	"How To" Record Data "How To" Do an Experiment "How To" Make an Opinion Survey "How To" Choose a Sample
GRAPHING	"How To" Choose Which Graph To Make "How To" Make a Bar Graph "How To" Make a Bar Graph Histogram "How To" Make a Conversion Graph "How To" Make a Line Chart "How To" Make a Line Graph "How To" Make a Scatter Graph "How To" Make a Slope Diagram
MEASURING	"How To" Use a Stopwatch "How To" Choose the Right Tool to Measure Distance "How To" Make a Scale Drawing
SIMPLIFYING DATA	"How To" Round Off Data "How To" Find the Median "How To" Find the Average

INTERMEDIATE "HOW TO" SERIES

This booklet-style series covers in more detail essentially the same information as the *Beginning "How To" Series* with a few booklets on additional skills. This series requires a greater reading skill and gives students a chance to read something they have a need to read. Those pertinent to Mass Communications are listed below.

COLLECTING DATA

"How To" Collect Good Data
"How To" Round Off Data as You Measure
"How To" Record Data
"How To" Do an Experiment
"How To" Make an Opinion Survey
"How To" Choose a Sample

GRAPHING

"How To" Choose Which Graph to Make
"How To" Make a Bar Graph
"How To" Make a Histogram
"How To" Make a Line Graph
"How To" Make a Conversion Graph
"How To" Use Graphs to Compare Two Sets of Data

MEASURING

"How To" Use a Stopwatch
"How To" Choose the Right Tool to Measure Distance
"How To" Make a Scale Drawing

SIMPLIFYING DATA

"How To" Tell What Your Data Show
"How To" Find the Median
"How To" Find the Mean
"How To" Find the Mode
"How To" Find Different Kinds of Ranges
"How To" Use Key Numbers to Compare Two Sets of Data

2. LIST OF BACKGROUND PAPERS

As students work on USMES challenges, teachers may need background information that is not readily accessible elsewhere. The Background Papers fulfill this need and often include descriptions of activities and investigations that students might carry out.

Below are listed titles of current Background Papers that teachers may find pertinent to Mass Communications. The papers are grouped in the categories shown, but in some cases the categories overlap. For example, some papers about graphing also deal with probability and statistics.

The Background Papers are being revised, reorganized, and rewritten. As a result, many of the titles will change.

DESIGN PROBLEMS	*DP 13 People and Space* by Gorman Gilbert
GRAPHING	*GR 3 Using Graphs to Understand Data* by Earle Lomon *GR 4 Representing Several Sets of Data on One Graph* by Betty Beck *GR 6 Using Scatter Graphs to Spot Trends* by Earle Lomon *GR 7 Data Gathering and Generating Graphs at the Same Time (or Stack 'Em and Graph 'Em at One Fell Swoop!)* by Edward Liddle
GROUP DYNAMICS	*GD 2 A Voting Procedure Comparison That May Arise in USMES Activities* by Earle Lomon
PROBABILITY AND STATISTICS	*PS 1 Collecting Data in Sets or Samples* by USMES Staff *PS 4 Design of Surveys and Samples* by Susan J. Devlin and Anne E. Freeny *PS 5 Examining One and Two Sets of Data Part I: A General Strategy and One-Sample Methods* by Lorraine Denby and James Landwehr *PS 6 Examining One and Two Sets of Data Part II: A Graphical Method for Comparing Two Samples* by Lorraine Denby and James Landwehr
RATIOS, PROPORTIONS, AND SCALING	*R 1 Graphic Comparison of Fractions* by Merrill Goldberg *R 2 Geometric Comparison of Ratios* by Earle Lomon *R 3 Making and Using a Scale Drawing* by Earle Lomon

3. BIBLIOGRAPHY OF NON-USMES MATERIALS

The following references and materials may be helpful for classes working on a Mass Communications challenge. The USMES Guide contains a list of references on general mathematics and science topics. (Publisher's prices, where listed, may have changed.)

Books for Teachers

Lidstone, John and Don McIntosh. *Children as Film Makers.* 1970. Van Nostrand Reinhold Company, 450 W. 33rd Street, New York City, NY 10001. ($7.95)
An excellent reference for teachers of all grades whose students are interested in movie production. Includes advice on selection of movie camera, care and maintenance, and basic operation. Drawings and photographs illustrate explanations on how to edit film, use sound, and make animated movies.

Ring, Arthur. *Planning and Producing Handmade Slides and Filmstrips for the Classroom.* 1974. Lear Siegler, Inc./ Fearon Publishers, 6 Davis Drive, Belmont, CA 94002. ($2.75)
Explains and illustrates how simple handmade slides and filmstrips can be made in the classroom using inexpensive materials such as acetate film, thermofax transparency, overexposed and underexposed commercially mounted slides, and clear adhesive shelf paper. Also includes master worksheets for both slide shows and filmstrips, along with advice on making presentations.

The Center for Understanding Media. *Doing the Media: A Portfolio of Activities and Resources.* 1972. The Center for Understanding Media, Inc., 75 Horatio Street, New York City, NY 10014. ($5.00)
Introduction to use of various visual media, photography, film, and video, and description of practical classroom-tested activities, such as Super-8 animation, storyboarding, making slides without a camera, using an overhead projector.

Workshop for Learning Things, 5 Bridge Street, Watertown, MA 02172.

_____. *The Camera Cookbook.* ($3.50)
An illustrated guide to use with inexpensive photo-

graphic materials and equipment also available from workshop for Learning Things. Explains how to use camera, develop film, and make prints in the classroom without use of a darkroom.

Books for Students

Workshop for Learning Things, 5 Bridge Street, Watertown, MA 02172.

_____. *Children Write.* ($3.50)
A folder containing children's writings, drawings, and photographs. Good examples for students who are producing their own books.

_____. *It's So Simple: Click and Print.* ($2.00)
A fifth-grade class explains in their own words, photographs, and drawings how to use a simple camera, develop negatives without using a darkroom, and make prints on three kinds of reproductive paper.

_____. *"Most of the Pictures Came Out Real Well."* ($1.50)
Original writings and photographs by fifth and sixth graders who used simple, inexpensive cameras.

_____. *The Label Press.* ($1.00)
A booklet with suggestions for children on using plastic label makers to print multiple copies.

Elementary Science Study (ESS). *Children Printing.* Distributed by the Teachers Bookshop, 90 Sherman Street, Cambridge, MA 02140. ($1.50)
Examples of printing done mainly on letter press and silk screen press by children from grades one to six.

Inexpensive Media Equipment and Materials

Both sources listed below sell excellent, low-cost materials, especially developed for children's use. Write for each project's catalog for complete descriptions and order forms.

Workshop for Learning Things, 5 Bridge Street, Watertown, MA 02172. (*Our Catalog*, $1.00)

_____. *Bookmaking Instruction Kit.* ($5.95)
Includes posters with instructions for three methods of bookbinding, and tools and materials to make five books of each type.

_____. *Paper Making Kit.* ($68.00)
Materials and instructions for a simple method of recycling small quantities of paper.

_____. *Offset Printing Press.* ($19.50)
Reusable press and supplies for transferring printing from master sheet onto paper up to 8½" x 11".

_____. *Printing Press Kit.* ($163.00)
Contains type case, press bed, type font, and all equipment needed for printing.

_____. *Camera Kits.*
Several kits available include 3-Camera Kit ($36.00), 6-Camera Kit ($81.50), and 35-Camera Kit ($295.00). Each contains simple cameras, black and white film, *Camera Cookbook*, and supplies for taking, developing, and reproducing photographs without using a darkroom. Additional supplies may be purchased individually or in expandable kits.

Selective Educational Equipment (SEE), Inc., 3 Bridge Street, Newton, MA 02195. (Free catalog)

_____. *6-Student Camera and Enlarger Kit.* ($93.50)
Contents of 6-Student Camera Kit plus equipment for developing negatives and making darkroom enlargements from 35mm, 120, 126, and 127 square film.

_____. *Photo Enlarger.* ($12.50)
Materials for use with either 6-Student Camera Kit; masking tape, 6 five-quart plastic pails, clothespins, sponges, twine, 6 large trays.

4. GLOSSARY

The following definitions may be helpful to a teacher whose class is investigating a Mass Communications challenge. Some of the words are included to give the teacher an understanding of technical terms; others are included because they are commonly used throughout the resource book.

These terms may be used when they are appropriate for the children's work. For example, a teacher may tell the children that when they conduct surveys, they are collecting *data*. It is not necessary for the teacher or students to learn the definitions nor to use all of the terms while working on their challenge. Rather, the children will begin to use the words and understand the meanings as they become involved in their investigations.

Audio	Relating to the transmission, reception, or reproduction of sound.
Audiovisual	Relating to both hearing and sight.
Average	The numerical value obtained by dividing the sum of the elements of a set of data by the number of elements in that set. Also called the mean.
Caption	An explanatory title that accompanies a drawing or photograph.
Conversion	Changing from one form to another. Generally associated in mathematics and science with the change from one unit of measurement to another or the change from one form of energy to another.
Correlation	A relation between two sets of data.
Cost	The amount of money needed to produce or to purchase goods or services.
Darkroom	An unlighted room used for handling light-sensitive materials, such as photographic negatives.
Data	Any facts, quantitative information, or statistics.

Decibel	A unit of measurement of sound intensity. The number of decibels is equal to ten times the logarithm of the ratio of the sound intensity and a standard reference point. The reference point is the power required to produce a barely audible sound at a frequency of 1000 Hertz (i.e., a pitch nearly two octaves above middle C).

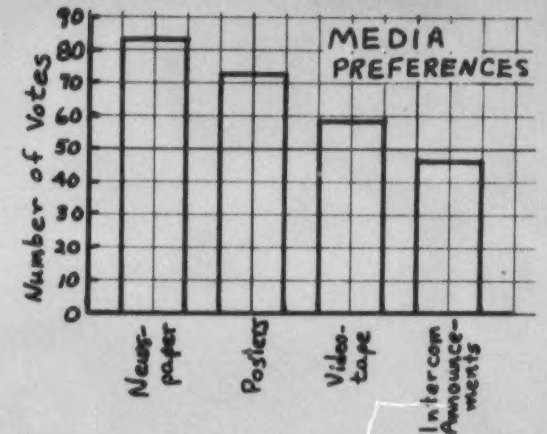
Relative Intensities of Sounds

	in decibels	in microwatts/cm^2
threshold of hearing	0	10^{-10}
rustling leaves	20	10^{-8}
talking (at 3 ft.)	40	10^{-6}
noisy office or store	60	10^{-4}
subway car	100	1
threshold of pain	120	100

Develop	To treat exposed photograph materials with chemicals which produce a visible image.
Distribution	The spread of data over the range of possible results.
Edit	To collect and arrange materials into a finished publication or broadcast.
Film	A thin sheet of cellulose treated with light-sensitive emulsion and used for taking photographs.
Frequency	The number of times a certain event occurs in a given unit of time or in a given total number of events.
Graph	A drawing or picture of one or several sets of data.
Bar Graph	A graph of a set of measures or counts whose sizes are represented by the vertical (or horizontal) lengths of bars of equal widths or lines. Example: the number of people who preferred particular presentations.

Bar Graph (cont.)

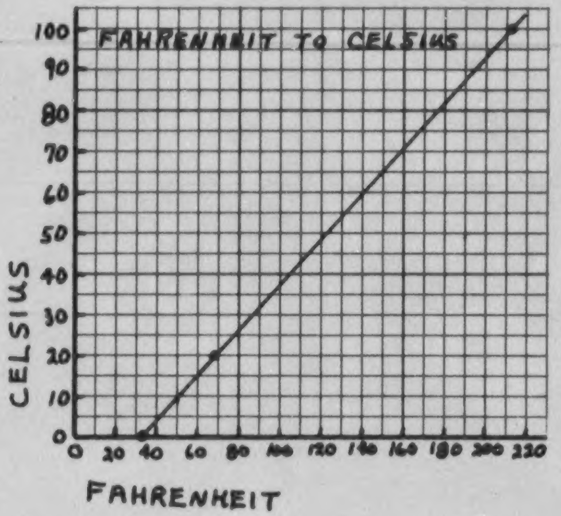
Presentation	No. of Votes
Newspaper	83
Posters	72
Videotape	59
Intercom Announcements	47



Conversion Graph

A line graph that is used to change one unit of measurement to another. For example, changing Fahrenheit to Celsius or vice versa.

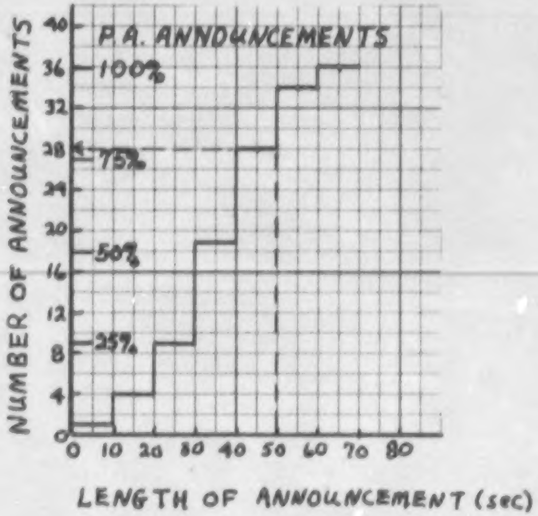
Celsius	Fahrenheit
0°	32°
20°	68°
100°	212°



Cumulative Distribution Graph

A graph that can be constructed from a histogram by computing running totals from the histogram data. The first running total is the first value in the histogram data (see table of values). The second running total is the sum of the first and second values of the histogram, the third is the sum of the first, second, and third values, and so on. The horizontal scale on the graph is similar to that of the histogram; the vertical scale goes from 0 to the total number of events observed or samples taken (in the example, the total number of public address announcements that were timed). Each vertical distance on the graph shows the running total for the value shown on the horizontal scale; thus the graph below indicates that 28 public address announcements, or about 78 per cent of the total, lasted 50 seconds or less.

Length of Announcement	Total Number of Announcements
10 sec. or less	1
20 sec. or less	4
30 sec. or less	9
40 sec. or less	19
50 sec. or less	28
60 sec. or less	34
70 sec. or less	36

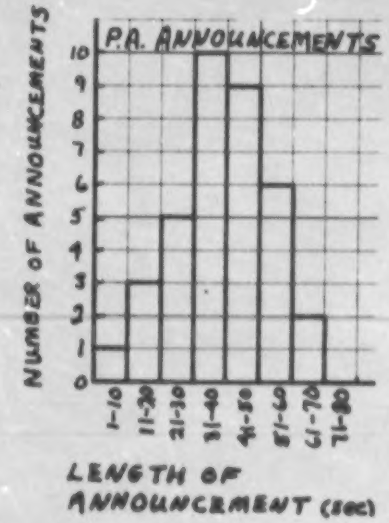


Histogram

A type of bar graph that shows the distribution of the number of times that different measures or counts of the same event have occurred. A histogram always shows numerical data on the horizontal axis. Example: the number of public address announcements that lasted a given amount of time.

Histogram (cont.)

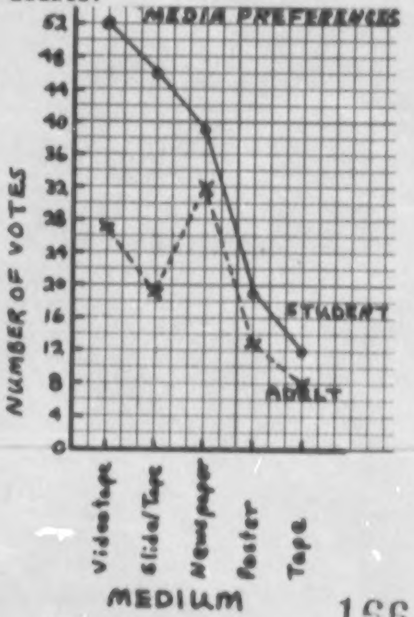
Length of Announcement (sec.)	Number of Announcements
1-10	1
11-20	3
21-30	5
31-40	10
41-50	9
51-60	6
61-70	2



Line Chart

A bar graph that is represented by circles, triangles, or crosses with lines connecting them so that is has the appearance of a line graph. (See *Line Graph.*) This is a useful representation when two or more sets of data are shown on the same graph. Example: the media presentations preferred by students and by adults.

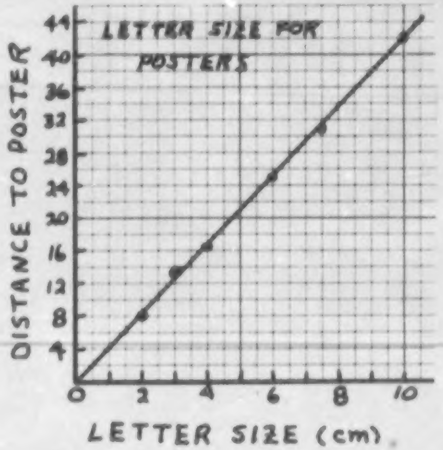
Medium	Preferences Student	 Adult
Videotape	52	27
Slide/Tape	46	19
Newspaper	39	32
Poster	19	13
Tape	12	8



Line Graph

A graph in which a smooth line or line segments pass through or near points representing members of a set of data. Since the line represents an infinity of points, the variable on the horizontal axis must be continuous. If the spaces between the markings on the horizontal axis have no meaning, then the graph is not a line graph, but a line chart (see *Line Chart*), even if the data points are connected by lines. Example: the size of letters on a poster vs. the distance from which they can be read. (This is a line graph because the size of letters that can be read at 38 meters is found to be 9 centimeters, even though no such measurement was actually made.)

Letter size (cm)	Distance Away (m)
2	8
3	13
4	16.5
6	25
7.5	31
10	42

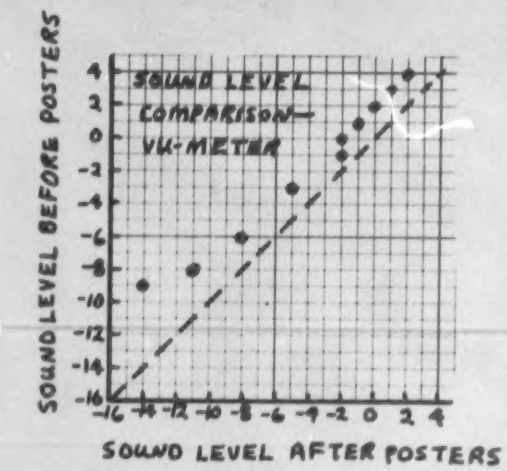


Q-Q Graph

A graph that shows the comparison between the same type of data collected from two groups of people or from two different situations. Example: sound level readings (taken with a VU-meter on a tape recorder) before and after posters asking students to be quiet are put up. The data for each set is ordered and the smallest measurement of one set plotted against the smallest of the other set, the second smallest against the second smallest, etc. The scatter of points is compared to a reference line, a dashed 45° line that represents data from two identical sets.

Q-Q Graph (cont.)

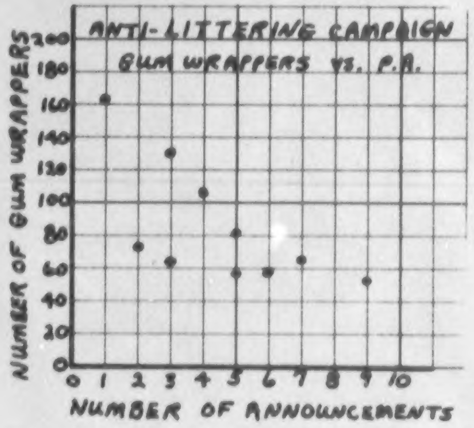
VU-METER READINGS	
Before Posters	After Posters
-9	-14
-8	-11
-6	-8
-3	-5
-1	-2
0	-2
+1	-1
+2	0
+3	+1
+4	+2



Scatter Graph

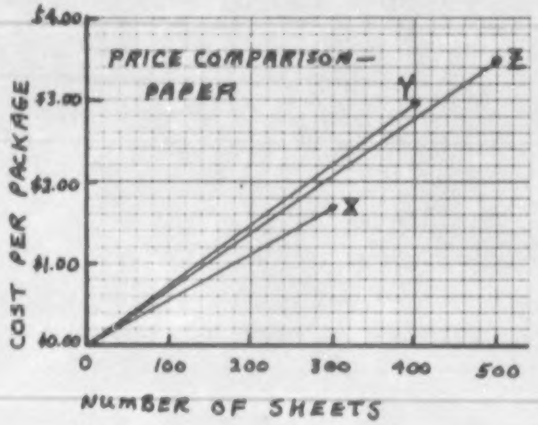
A graph showing a scatter of points, each of which represents two characteristics of the same thing. For example, in the graph below, the position of each point indicates the number of gum wrappers picked up that week vs. the number of intercom announcements in one week about littering.

Number of Announcements	Number of Wrappers
1	162
3	130
4	106
5	81
7	65
9	52
6	59
5	57
3	64
2	72



*Slope Diagram**	A graphical means of comparing fractions or ratios. To represent the ratio a/b, plot the point (b,a) and draw a line from (b,a) to the origin, (0,0). The slope of this line represents the ratio a/b. By comparing slopes of different lines, different ratios can be compared; the steeper the line the larger the ratio. For example, the diagram below shows the ratio of price to number of sheets for different brands of paper for duplicating. The ratio of price to sheet for Brand X is smaller than that for Brands Y or Z, and therefore, Brand X costs the least per sheet.

Brand	Sheets of Paper	Cost
X	300	$1.69
Y	400	$2.97
Z	500	$3.50



Histogram	See *Graph*.
Hypothesis	A tentative conclusion made in order to test its implications or consequences.
Inference	An assumption derived from facts or information considered to be valid and accurate.
Lens	A piece of glass or other transparent substance that is used in an optical instrument to form a sharp image by focusing light rays.
Mapping	Assigning each element in one set of data to a corresponding element in another set.
Mass Production	The process of making something in quantity.
Matrix	A chart of data arranged in rows and columns.

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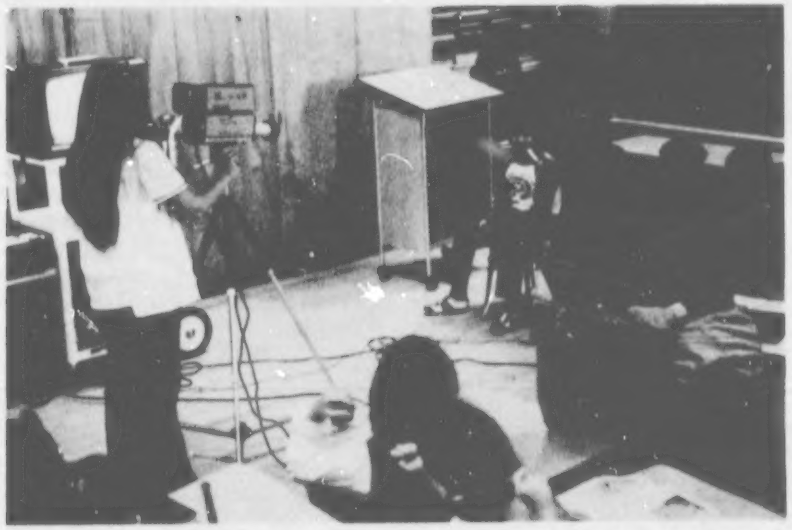
*Formerly called Triangle Diagram.

Mean	See *Average.*
Median	The middle value of a set of data in which the elements have been ordered from smallest to largest. The median value has as many elements above it as below it. Example: the middle time from several measurements of the length of an intercom announcement.
Medium	A channel of communication, usually a publication or broadcast. (Plural = media.)
Mode	The element or elements in a set of data that occur most often.
Negative	A transparent material that carries a photographic image and is used for printing photographs.
Ordered Set	A set of data arranged from smallest to largest.
Per Cent	Literally, per hundred. A ratio in which the denominator is always 100, e.g., 72 per cent = 72/100 = 0.72 = 72%, where the symbol % represents 1/100.
Percentage	A part of a whole expressed in hundredths.
Population	Any group of objects (e.g., people) or events from which samples are taken for statistical measurement.
Probability	The likelihood or chance (expressed numerically) of one event occurring out of several possible events.
Proportion	A statement of equality of two ratios, i.e., the first term divided by the second term equals the third term divided by the fourth term, e.g., 5/10 = 1/2. Also a synonum for ratio: when two quantities are in direct proportion, their ratios are the same.
Quartile	
First	The first quartile is the value of the quarter-way piece of data in an ordered set of data.
Third	The third quartile is the value of the three-quarter-way piece of data in an ordered set of data.
Interquartile Range	The range or spread, of the middle 50% of an ordered set of data; the difference between the third and first quartiles.

Range	The difference between the smallest and the largest values in a set of data.
Rank	To order the members of a set according to some criterion. such as size or importance. Example: to put pieces of data from smallest to largest.
Ratio	The quotient of two denominate numbers or values indicating the relationship in quantity, size or amount between two different things. For example, the ratio of 20 female audience members to 24 male audience members is 5:6.
Sample	A representative fraction of a population studied to gain information about the whole population.
Sample Size	The number of elements in a sample.
Set	A collection of characteristics, persons, or objects. Each thing in a set is called a member or an element.
Slope Diagram	See *Graph*.
Sound Intensity	The level or loudness of a sound. A measure of how much sound energy flows through a given area in a given time. Measured in decibels or watts/cm^2.
Sound Level Meter	An instrument used to measure sound intensity.
Statistics	The science of drawing conclusions or making predictions using a collection of quantitative data.
Storyboard	An ordered series of pictures which tell a story.
Tally	A visible record used to keep a count of some set of data, especially a record of the number of times one or more events occur. Example: a count of the number of students who perfer a videotaped message rather than a written message.
Temperature	A measure of hotness or coldness. Technically, an indication of the average kinetic energy of molecules. Temperature is commonly measured in degrees Fahrenheit or degrees centigrade (Celsius).

Thermometer, Celsius	A thermometer on which the interval between the normal freezing and boiling points of water is divided into 100 parts or degrees, ranging from 0°C to 100°C.
Thermometer, Fahrenheit	A thermometer on which the interval between the normal freezing and boiling points of water is divided into 180 parts or degrees, ranging from 32°F. to 212°F.
Video	Relating to the transmission or reception of the television image.
Videotape	A magnetic tape used to record a television production.



E. Skills, Processes, and Areas of Study Utilized in Mass Communications

The unique aspect of USMES is the degree to which it provides experience in the process of solving real problems. Many would agree that this aspect of learning is so important as to deserve a regular place in the school program even if it means decreasing to some extent the time spent in other important areas. Fortunately, real problem solving is also an effective way of learning many of the skills, processes, and concepts in a wide range of school subjects.

On the following pages are five charts and an extensive, illustrative list of skills, processes and areas of study that are utilized in USMES. The charts rate Mass Communications according to its potential for learning in various categories of each of five subject areas--real problem solving, mathematics, science, social science, and language arts. The rating system is based on the amount that each skill, process, or area of study within the subject areas is used--extensive (1), moderate (2), some (3), little or no use (-). (The USMES Guide contains a chart that rates all USMES units in a similar way.)

The chart for real problem solving presents the many aspects of the problem-solving process that students generally use while working on an USMES challenge. A number of the steps in the process are used many times and in different orders, and many of the steps can be performed concurrently by separate groups of students. Each aspect listed in the chart applies not only to the major problem stated in the unit challenge but also to many of the tasks each small group undertakes while working on a solution to the major problem. Consequently, USMES students gain extensive experience with the problem-solving process.

The charts for mathematics, science, social science, and language arts identify the specific skills, processes, and areas of study that may be learned by students as they respond to a Mass Communications challenge and become involved with certain activities. Because the students initiate the activities, it is impossible to state unequivocally which activities will take place. It is possible, however, to document activities that have taken place in USMES classes and identify those skills and processes that have been used by the students.

Knowing in advance which skills and processes are likely to be utilized in Mass Communications and knowing the extent that they will be used, teachers can postpone the teaching of those skills in the traditional manner until later in the year. If the students have not learned them during their USMES activities by that time, they can study them in the usual way. Further, the charts enable a teacher to integrate USMES more readily with other areas of classroom work. For example, teachers may teach fractions during math period when fractions are also being learned and utilized in the students' USMES activities. Teachers who have used USMES for several successive years have found that students are more motivated to learn basic skills when they have determined a need for them in their USMES activities. During an USMES session the teacher may allow the students to learn the skills entirely on their own or from other students, or the teacher may conduct a skill session as the need for a particular skill arises.

Because different USMES units have differing emphases on the various aspects of problem solving and varying amounts of possible work in the various subject areas, teachers each year might select several possible challenges, based on their students' previous work in USMES, for their class to consider. This choice should provide students with as extensive a range of problems and as wide a variety of skills, processes, and areas of study as possible during their years in school. The charts and lists on the following pages can also help teachers with this type of planning.

Some USMES teachers have used a chart similar to the one given here for real problem solving as a record-keeping tool, noting each child's exposure to the various aspects of the process. Such a chart might be kept current by succeeding teachers and passed on as part of a student's permanent record. Each year some attempt could be made to vary a student's learning not only by introducing different types of challenges but also by altering the specific activities in which each student takes part. For example, children who have done mostly construction work in one unit may be encouraged to take part in the data collection and data analysis in their next unit.

Following the rating charts are the lists of explicit examples of real problem solving and other subject area skills, processes, and areas of study learned and utilized in Mass Communications. Like the charts, these lists are based on documentation of activities that have taken place in USMES classes. The greater detail of the lists allows teachers to see exactly how the various basic skills, processes, and areas of study listed in the charts may arise in Mass Communications.

The number of examples in the real problem solving list have been limited because the list itself would be unreasonably long if all the examples were listed for some of the categories. It should also be noted that the example(s) in the first category--*Identifying and Defining Problems*--have been limited to the major problem that is the focus of the unit. During the course of their work, the students will encounter and solve many other, secondary problems, such as the problem of how to display their data or how to draw a scale layout.

Breaking down an interdisciplinary curriculum like USMES into its various subject area components is a difficult and highly inexact procedure. Within USMES the various subject areas overlap significantly, and any subdivision must be to some extent arbitrary. For example, where does measuring as a mathematical skill end and measurement as science and social science process begin? How does one distinguish between the processes of real problem solving, of science, and of social science? Even within one subject area, the problem still remains--what is the difference between graphing as a skill and graphing as an area of study? This probem has been partially solved by judicious choice of examples and extensive cross-referencing.

Because of this overlap of subject areas, there are clearly other outlines that are equally valid. The scheme presented here was developed with much care and thought by members of the USMES staff with help from others knowledgeable in the fields of mathematics, science, social science, and language arts. It represents one method of examining comprehensively the scope of USMES and in no way denies the existence of other methods.

REAL PROBLEM SOLVING	Overall Rating
Identifying and defining problem.	1
Deciding on information and investigations needed.	1
Determining what needs to be done first, setting priorities.	1
Deciding on best ways to obtain information needed.	1
Working cooperatively in groups on tasks.	1
Making decisions as needed.	1
Utilizing and appreciating basic skills and processes.	1
Carrying out data collection procedures--observing, surveying, researching, measuring, classifying, experimenting, constructing.	1
Asking questions, inferring.	1
Distinguishing fact from opinion, relevant from irrelevant data, reliable from unreliable sources.	1

REAL PROBLEM SOLVING	Overall Rating
Evaluating procedures used for data collection and analysis. Detecting flaws in process or errors in data.	2
Organizing and processing data or information.	2
Analyzing and interpreting data or information.	2
Predicting, formulating hypotheses, suggesting possible solutions based on data collected.	1
Evaluating proposed solutions in terms of practicality, social values, efficacy, aesthetic values.	1
Trying out various solutions and evaluating the results, testing hypotheses.	1
Communicating and displaying data or information.	2
Working to implement solution(s) chosen by the class.	1
Making generalizations that might hold true under similar circumstances; applying problem solving process to other real problems.	1

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use

MATHEMATICS	Overall Rating
Basic Skills	
Classifying/Categorizing	2
Counting	1
Computation Using Operations	
Addition/Subtraction	2
Multiplication/Division	2
Fractions/Ratios/Percentages	2
Business and Consumer Mathematics/ Money and Finance	2
Measuring	2
Comparing	3
Estimating/Approximating/Rounding Off	2
Organizing Data	1
Statistical Analysis	2
Opinion Surveys/Sampling Techniques	2
Graphing	2
Spatial Visualization/Geometry	1
Areas of Study	
Numeration Systems	2
Number Systems and Properties	1
Denominate Numbers/Dimensions	1
Scaling	2
Symmetry/Similarity/Congruence	-
Accuracy/Measurement Error/ Estimation/Approximation	1
Statistics/Random Processes/Probability	1
Graphing/Functions	1
Fraction/Ratio	1
Maximum and Minimum Values	3
Equivalence/Inequality/Equations	2
Money/Finance	2
Set Theory	3

SCIENCE	Overall Rating
Processes	
Observing/Describing	1
Classifying	3
Identifying Variables	3
Defining Variables Operationally	3
Manipulating, Controlling Variables/ Experimenting	3
Designing and Constructing Measuring Devices and Equipment	3
Inferring/Predicting/Formulating, Testing Hypotheses/Modeling	1
Measuring/Collecting, Recording Data	1
Organizing, Processing Data	1
Analyzing, Interpreting Data	1
Communicating, Displaying Data	2
Generalizing/Applying Process to New Problems	1
Areas of Study	
Measurement	2
Motion	-
Force	-
Mechanical Work and Energy	-
Solids, Liquids, and Gases	-
Electricity	-
Heat	-
Light	1
Sound	1
Animal and Plant Classification	-
Ecology/Environment	-
Nutrition/Growth	-
Genetics/Heredity/Propagation	-
Animal and Plant Behavior	-
Anatomy/Physiology	-

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use

SOCIAL SCIENCE	Overall Rating
Process	
Observing/Describing/Classifying	2
Identifying Problems, Variables	1
Manipulating, Controlling Variables/ Experimenting	3
Inferring/Predicting/Formulating, Testing Hypotheses	1
Collecting, Recording Data/Measuring	2
Organizing, Processing Data	2
Analyzing, Interpreting Data	2
Communicating, Displaying Data	2
Generalizing/Applying Process to Daily Life	1
Attitudes/Values	
Accepting responsibility for actions and results	1
Developing interest and involvement in human affairs	1
Recognizing the importance of individual and group contributions to society	1
Developing inquisitiveness, self-reliance, and initiative	1
Recognizing the values of cooperation, group work, and division of labor	1
Understanding modes of inquiry used in the sciences, appreciating their power and precision	1
Respecting the views, thoughts, and feelings of others	1
Being open to new ideas and information	1
Learning the importance and influence of values in decision making	1
Areas of Study	
Anthropology	-
Economics	1
Geography/Physical Environment	-
Political Science/Government Systems	3
Recent Local History	2
Social Psychology/Individual and Group Behavior	1
Sociology/Social Systems	1

LANGUAGE ARTS	Overall Rating
Basic Skills	
Reading	
Literal Comprehension: Decoding Words, Sentences, Paragraphs	2
Critical Reading: Comprehending Meanings, Interpretation	1
Oral Language	
Speaking	1
Listening	1
Memorizing	2
Written Language	
Spelling	1
Grammar: Punctuation, Syntax, Usage	1
Composition	1
Study Skills	
Outlining/Organizing	1
Using References and Resources	3
Attitudes/Values	
Appreciating the value of expressing ideas through speaking and writing	1
Appreciating the value of written resources	3
Developing an interest in reading and writing	1
Making judgments concerning what is read	1
Appreciating the value of different forms of writing, different forms of communication	1

KEY: 1 = extensive use, 2 = moderate use,
3 = some use, - = little or no use

REAL PROBLEM SOLVING IN MASS COMMUNICATIONS

Identifying and Defining Problems	• Students identify traffic regulations for bicyclists as a topic or problem about which they would like to inform many people. • See also SOCIAL SCIENCE list: *Identifying Problems, Variables*.
Deciding on Information and Investigations Needed	• Students decide that they need to determine who would be interested in their message. • After a discussion students decide to find out what media materials and equipment are available and how they can learn to use or operate equipment with which they are unfamiliar. • Students agree to research for further information about traffic regulations for bicyclists.
Determinine What Needs to Be Done First, Setting Priorities	• Students decide to find out what equipment is available, costs of supplies, and how they can obtain funding. • Students decide to learn to use media equipment and to conduct research for content of presentations before developing actual presentations.
Deciding on Best Ways to Obtain Information Needed	• Students decide to conduct a survey to find out how much adults and children know about traffic regulations for bicyclists. • Students ask personnel from school or district media department and experienced adults for help in using various media equipment. • Students decide to interview policemen about traffic regulations for bicyclists.
Working Cooperatively in Groups on Tasks	• Students form groups (1) to survey adults and children about knowledge of bicycle rules, (2) to find out about availability of equipment and supplies, and cost of various media presentations, and (3) to collect data for content of presentations. • Students form groups to develop several presentations using one medium or several media.
Making Decisions as Needed	• Students decide to work in groups so that they can carry out more activities.

Making Decisions as Needed (cont.)	• Students decide to survey every fifth person who passes by a certain location. • Students decide that certain media will be best to use in reaching their intended audience. • Students decide that a certain design or a certain script is better than others. • Students decide which information will be best suited for each medium. • Students decide to compare effectiveness of their presentations using several media by conducting and comparing tests on knowledge about traffic regulations for bicyclists both before and after presentations.
Utilizing and Appreciating Basic Skills and Processes	• Students write clearly worded questions for their survey. • Students write easily understood messages and scripts for their presentations. • Students measure size of lettering and posterboard and size of Tri-Wall for making scenery. • Students use stopwatches to time lengths of their presentations. • Students give oral presentations. • Students draw graphs of survey data. • Students recognize that telling others about rules of the road for bicyclists will help many people besides themselves. • See also MATHEMATICS, SCIENCE, SOCIAL SCIENCE, and LANGUAGE ARTS lists.
Carrying Out Data Collection Procedures--Opinion Surveying, Researching, Measuring, Classifying, Experimenting, Constructing	• Students conduct opinion surveys to find out which type of medium is preferred. • Students measure length of their presentations. • Students research additional information from books in library. • Students classify important characteristics from each medium and types of commercial presentations using that medium. • Students make stage scenery for their skit and for their videotape production. • See also MATHEMATICS list: *Classifying/Categorizing; Measuring.* • See also SCIENCE list: *Observing/Describing; Classifying; Manipulating, Controlling Variables/Experimenting; Designing and Constructing Measuring Devices and Equipment; Measuring/Collecting, Recording Data.*

Carrying Out Data Collection Procedures--Opinion Surveying, Researching, Measuring, Classifying, Experimenting, Constructing (cont.)	• See also SOCIAL SCIENCE list: *Observing/Describing/Classifying; Manipulating, Controlling Variables/Experimenting; Collecting, Recording Data/Measuring.*
Asking Questions, Inferring	• Students ask whether both children's and adults' knowing traffic rules for bicyclists is a problem. They infer from data collected that it is. • Students ask which media presentations will reach the largest number of people. They infer from their data and from their estimations that posters and public address announcements will reach more schoolmates while flyers and posters will reach more people in the community. • Students ask which media presentation was most effective. They decide that the one that best informed the audience about traffic rules for bicyclists was most effective and infer from their data that a certain presentation was most effective. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses.*
Distinguishing Fact from Opinion, Relevant from Irrelevant Data, Reliable from Unreliable Data	• Students recognize the qualitative aspects of data gathered from preference surveys as distinct from quantitative data on knowledge gained from media presentations as obtained from pretests and posttests. • Students recognize that media instructors and hobbyists are good sources of information on using media. • Students recognize that they must clearly differentiate between fact and opinion when making an unbiased presentation.
Evaluating Procedures Used for Data Collection and Analysis, Detecting Flaws in Process or Errors in Data	• Students decide that their questionnaires need revisions and they discuss improvements that can be made. • Students decide to use a larger sample for their opinion survey. • Students decide to take repeated timings of a presentation to find the median time. • Students decide that using a tape measure rather than a meter stick gives them more accurate dimensions of the stage.

Evaluating Procedures Used for Data Collection and Analysis, Detecting Flaws in Process or Errors in Data (cont.)	• See also MATHEMATICS list: *Estimating/Approximating/Rounding Off.*
Organizing and Processing Data	• Students order and group survey data on preferred media to make bar graphs and histograms. • Students record their data on number of people reached by different presentations on charts and on graphs. • See also MATHEMATICS list: *Organizing Data.* • See also SCIENCE and SOCIAL SCIENCE lists: *Organizing, Processing Data.*
Analyzing and Interpreting Data	• Students find the median time for each presentation. • Students analyze their bar graphs to find which presentations reached the largest audience. • Students find that children preferred presentations involving both sight and sound and adults preferred visual presentations. • Students analyze and compare the pretests and posttests to determine which presentation was most effective in conveying information on traffic regulations for bicyclists. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques; Variable Rates of Change/Maximum and Minimum Values.* • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data.*
Predicting, Formulating Hypotheses, Suggesting Possible Solutions Based on Data Collected	• As a result of their analyses of commercial media presentations, students predict the characteristics that a good presentation should have. • Students hypothesize that the results of one sample survey reflect the general knowledge of their schoolmates about traffic regulations for bicyclists. • Students make predictions about the number of people who will be reached by different media. • Students hypothesize that posters placed in busy locations will be noticed by more people. • Students suggest using the medium they have found to be most effective to other classes who wish to communicate with many other people • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses.*

Evaluating Proposed Solutions in Terms of Practicality, Social Values, Efficacy, Aesthetic Values	• Students discuss advantages and disadvantages of each media presentation in terms of cost, time needed for presentation in terms of cost, time needed for preparation, number of people reached, and effectiveness of conveying message.
Trying Out Various Solutions and Evaluating the Results, Testing Hypotheses	• Students use rehearsals to try out different ways of giving their presentations. • Students use various media to convey their message and then assess the efficacy of each. • Students compare results of pretests and posttests. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses.*
Communicating and Displaying Data or Information	• Groups report to the class on their findings. • Students draw bar graphs to show size of audiences attending presentations, preferences of adults and students. • Students draw histograms of number of questions answered correctly on pretests and posttests. • Students use a storyboard technique to arrange their slides in sequence and to develop the script. • See also MATHEMATICS list: *Graphing; Scaling.* • See also SCIENCE and SOCIAL SCIENCE lists: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Working to Implement Solution(s) Chosen by the Class	• Students convey their message by making several presentations using one medium or several media.
Making Generalizations That Might Hold True Under Similar Circumstances; Applying Problem-Solving Process to Other Real Problems	• Students find that they can apply graphing and survey skills to other problems. • Students working on Mass Communications apply skills acquired to work on Advertising and other USMES units and to problems involving communicating with a large number of people. • See also SCIENCE list: *Generalizing/Applying Process to New Problems.* • See also SOCIAL SCIENCE list: *Generalizing/Applying Process to Daily Life.*

ACTIVITIES IN MASS COMMUNICATIONS UTILIZING MATHEMATICS

Basic Skills

Classifying/Categorizing	• Categorizing characteristics of professional media presentations (TV and radio programs, slide shows, newspapers, flyers, billboards, etc.). • Categorizing characteristics of a medium in more than one way. • Organizing and classifying sets of media equipment, materials, activities, or information. • Using the concepts and language of sets (subsets, unions, intersections, set notations) to classify audiences and to plan presentations according to audience preference. • See also SCIENCE list: *Classifying*. • See also SOCIAL SCIENCE list: *Observing/Describing/Classifying*.
Counting	• Counting votes for choice of media to use in communicating message. • Counting survey data, questionnaire data on audience preference for particular media presentations. • Counting number of seconds in a taped message, number of locations for poster placement, number of people in audience, number of inches when constructing stage scenery. • Counting to read scales on thermometers, sound-level meters, light meters, or meter sticks. • Counting by sets to find scale for graph axes.
Computation Using Operations: Addition/Subtraction	• Adding one-, two-, or three-digit whole numbers to find total tally of people reached by several presentations or total measurement of poster board needed. • Adding minutes and seconds when timing oral presentations such as skits, slide/tape shows, videotapes, radio or intercom announcements. • Subtracting to find differences between predicted and actual size of audience at a particular presentation, amount of paper needed for newspaper. • Subtracting to find differences between predicted and actual test scores of children and adults after viewing a presentation. • Subtracting one-, two-, or three-digit whole numbers to find ranges for graph axes or measurement data or to compare sets of data.

Computation Using Operations: Multiplication/Division

- Multiplying whole numbers to find total tally of people who will pass by a poster display during a week, total number of transparencies needed for making slides.
- Multiplying or dividing to find scale for graph axes.
- Dividing to find unit measure of paper needed for each flyer.
- Multiplying and dividing to convert from yards to feet and vice versa, meters to centimeters and vice versa, and seconds to minutes and vice versa.
- Dividing to calculate average number of people who pass by a poster location each day, average number of students in each classroom.
- Dividing to calculate ratios, fractions, or percentages.

Computation Using Operations: Fractions/Ratios/Percentages

- Using mixed numbers to calculate unit measures or averages.
- Changing fractions to higher or lower terms (equivalent fractions) to perform calculations.
- Using fractions and ratios to convert from inches to feet, degrees Fahrenheit to degrees centigrade.
- Using fractions in measurement, graphing, comparing measurements.
- Using slope diagrams to compare ratios of cost to quantity when figuring unit cost of supplies.
- Calculating percentage of students who pass by a certain poster location during the morning, percentage of audience who prefer one particular media presentation over another, percentage of improvement on posttest, percentage of photographs that turn out well.

Computation Using Operations: Business and Consumer Mathematics/Money and Finance

- Adding and subtracting dollars and cents to perform cost analysis on supplies needed for a particular presentation.
- Multiplying to find total cost of producing a presentation having several performances.
- Multiplying and dividing to perform cost analysis on needed materials that are available from different merchants.
- Dividing to find unit cost for each photograph taken.
- Gaining experience with finance: sources, uses, and limitations of revenues available for making media presentations.
- Investigating costs of equipment and materials needed for each presentation vs. use, budget restrictions, and number of people reached.
- Using comparison when shopping for media supplies and materials.

Computation Using Operations: Business and Consumer Mathematics/ Money and Finance (cont.)	• Assessing cost benefit of quantity purchases, benefit of mass production for booklets, posters, newsletters, and quality control.
Measuring	• Converting from cups to quarts to gallons of liquid needed for developing photographs, from degrees centigrade to degrees Fahrenheit when measuring water temperature. • Using arbitrary units, such as paces, to measure stage dimensions. • Using different standard units of measure to design layouts of posters, books, newspaper. • Using different measuring tools to record length, width, area, temperature, loudness, or brightness. • Reading measuring devices accurately. • Timing, using a stopwatch, the length of oral announcements. • See also SCIENCE list: *Measuring/Collecting, Recording Data.* • See also SOCIAL SCIENCE list: *Collecting, Recording Data/Measuring.*
Comparing	• Using the concept of *greater than* and *less than* in making comparisons of noise levels, amount of light, test results. • Comparing measurements obtained by using a meter stick and a tape measure. • Comparing qualitative information, such as people's observations and opinions, gathered from various sources. • Comparing qualitative data gathered from a preference survey with quantitative data gathered from pretests and posttests on content of message conveyed. • Comparing estimated and actual results of pretest and posttest, estimated and actual number of flyers to be distributed. • Making graphic comparisons of test scores or media preferences of students vs. adults. • Comparing pretest and posttest data on content of message conveyed by different presentations. • Making graphic comparisons of fractions and ratios on slope diagrams of amount vs. price of various media supplies. • Comparing costs of various media presentations. • See also SCIENCE list: *Analyzing, Interpreting Data.* • See also SOCIAL SCIENCE list: *Analyzing, Interpreting Data.*

Estimating/Approximating/Rounding Off	• Estimating error in qualitative judgments on media preferences when collecting survey data. • Estimating the number of people who will attend a presentation, who will pass by a given poster location, who will prefer a particular presentation. • Estimating amount of supplies needed for making slides, cost of Super-8 film for a five-minute movie. • Estimating placement of posters on walls or scenery on stage by eyeballing. • Using approximation in constructing props and scenery for skits. • Rounding off data according to accuracy required.
Organizing Data	• Recording data on charts. • Tallying votes to determine which media will be used to communicate message. • Tallying on bar graphs, histograms. • Tallying and ordering survey data, questionnaire data on media preferences. • Ordering numbers on graph axes. • Ordering the steps in a process, such as developing photographs. • Ordering units of measure in terms of size such as inch, foot, yard. • Ordering unit costs to determine which brands and types of materials are least expensive. • See also SCIENCE list: *Organizing, Processing Data.* • See also SOCIAL SCIENCE list: *Organizing, Processing Data.*
Statistical Analysis	• Finding the median in an ordered set of data on length of public address announcements, number of questions answered correctly on pretests and posttests. • Determining the range of data on public address announcements. • Finding the quartiles and interquartile range of repeated measurements. • Finding the average number of students in each classroom, average score on pretests nad posttests. • Taking repeated measurements of an oral announcement and using the median measurement • See also SCIENCE list: *Analyzing, Interpreting Data.* • See also SOCIAL SCIENCE list: *Analyzing, Interpreting Data.*

Opinion Surveys/Sampling Techniques

- Conducting surveys on media preferences; defining data collection methods and the makeup and size of sample.
- Devising methods of obtaining quantitative information about subjective opinions, such as people's views about effectiveness of media.
- Conducting pretest and posttest surveys on content of presentations.
- Evaluating survey methodology, administration of survey, size and makeup of samples.
- See also SCIENCE list: *Analyzing, Interpreting Data.*
- See also SOCIAL SCIENCE list: *Analyzing, Interpreting Data.*

Graphing

- Using alternative methods of displaying data, e.g., charts, graphs.
- Making a graph form--dividing axes into parts, deciding on an appropriate scale.
- Obtaining information from graphs.
- Representing data on graphs.
  - Bar graph--plotting number of people who preferred different media presentations.
  - Conversion graph--plotting inches vs. feet.
  - Cumulative distribution graph--plotting number of public address announcements that took certain times or less.
  - Histogram--plotting length of public address announcements and the number of times the different lengths happened.
  - Line chart--plotting student and adult responses for media preferences.
  - Q-Q plot--plotting pretest and posttest scores.
  - Scatter graph--plotting number of gum wrappers picked up that week vs. number of public address announcements in one week about littering.
  - Slope diagram--plotting cost per package of paper vs. number of sheets per package.
- See also SCIENCE list: *Communicating, Displaying Data.*
- See also SOCIAL SCIENCE list: *Communicating, Displaying Data.*

Spatial Visualization/Geometry

- Drawing a design of a newspaper masthead or a symbol to be used with each message.
- Constructing and using geometric figures, for example, triangles, circles, squares for stage scenery and props.

Spatial Visualization/Geometry (cont.)	• Using standard mensurational formulas, e.g., A = L x W (Area = Length x Width). • Making a flow diagram of actors' movements during skit.

Areas of Study

Numeration Systems	• Using decimal system in making metric measurement for camera distance. • Using decimal system in calculations involving money, such as cost analysis of different kinds of reproductive paper for developing photographs. • Using fractions in measuring length (parts of inches), volume (parts of cups).
Number Systems and Properties	• See *Computation Using Operations.*
Denominate Numbers/Dimensions	• See *Measuring.*
Scaling	• Using a map of the school to derive information on number of classrooms, on number of exits and entrances for poster placement. • Using maps of nearby areas for determining locations for handing out flyers.
Symmetry/Similarity/Congruence	• See *Spatial Visualization/Geometry.*
Accuracy/Measurement Error/ Estimation/Approximation	• See *Measuring* and *Estimating/Approximating/Rounding Off.*
Statistics/Random Processes/ Probability	• See *Statistical Analysis.*
Graphing/Functions	• See *Graphing.*
Fraction/Ratio	• See *Computation Using Operations: Fractions/Ratios/ Percentages.*

Maximum and Minimum Values	● Finding a media presentation that reaches the maximum number of people, considering budget restrictions. ● Using slope diagrams to find the minimum costs of supplies. ● Minimizing time needed to put together a booklet or newsletter by using an assembly line.
Equivalence/Inequality/Equations	● See *Comparing* and *Computation Using Operations*.
Money/Finance	● See *Computation Using Operations: Business and Consumer Mathematics/Money and Finance*.
Set Theory	● See *Classifying/Categorizing*.

ACTIVITIES IN MASS COMMUNICATIONS UTILIZING SCIENCE

Process	
Observing/Describing	• Observing and describing the different characteristics of commercial media presentations (e.g., bright colors, lively background music). • Observing and describing a problem that needs to be communicated to many people (e.g., traffic regulations for bicyclists). • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying*.
Classifying	• Classifying media according to senses affected, e.g., hearing, sight. • Classifying media according to equipment needed. • Classifying media according to type of activity required from audience, e.g., listening, reading, viewing. • See also MATHEMATICS list: *Classifying/Categorizing*. • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying*.
Identifying Variables	• Identifying variables that affect the quality of recording, such as quality of equipment, volume control on machine, distance of speaker from microphone, loudness of background noise, loudness of speaker's voice. • Identifying variables that affect the quality of a photograph when it is being taken, for example, type of film, brightness of object, shutter opening and speed, distance from object photographed, focus, steadiness of camera. • Identifying variables that may affect the quality of a videotape, including both audio and video. • Identifying variables that affect the sound of dialogue in a play, such as empty or full auditorium, direction speaker is facing, etc. • See also SOCIAL SCIENCE list: *Identifying Problems, Variables*.
Defining Variables Operationally	• Defining sound level as the VU-meter reading on a tape recorder when the volume is set at five.

Defining Variables Operationally (cont.)	• Defining room temperature of water for developing photos as the temperature measured by a thermometer is degrees Celsius (or Fahrenheit) at some given point in the room. • Defining amount of light as the reading on a light meter at a certain distance. • See also SOCIAL SCIENCE list: *Identifying Problems/ Variables*.
Manipulating, Controlling Variables/Experimenting	• Keeping the volume of the tape recorder at location of the microphone (or the location of the noise source) the same each time the sound level is measured. • Testing different types of film under the same conditions. • Testing different camera settings under the same conditions. • Using different amounts of time to rinse photograph negatives in different solutions while keeping the other steps in developing a photograph the same. • Testing the readability of posters by trying out different sizes, types, and colors of lettering; making sure that lettering is changed in only one way for each test. • Measuring traffic flow past certain poster locations at different times during the day. • Testing different lights for illumination of photos or play setting. • See also SOCIAL SCIENCE list: *Manipulating, Controlling Variables/Experimenting*.
Designing and Constructing Measuring Devices and Equipment	• Constructing a darkroom for use in developing and printing film. • Construcintg devices to measure light levels in various parts of the room or outdoors. • Constructing devices to measure sound levels in various parts of the room.
Inferring/Predicting/Formulating, Testing Hypotheses/Modeling	• Inferring from data that poster letters should be a certain size, type, and color. • Inferring from data that a certain type of film, a certain camera setting, certain lights, and a certain developing procedure produce the best photos. • Inferring from sound level data that certain people in a play, or making a recording, need to speak louder.

Inferring/Predicting/Formulating, Testing Hypotheses/Modeling (cont.)	• Hypothesizing that more people will read posters if placed in a certain location; testing hypothesis by collecting data on the number of people passing different locations. • Inferring from videotape trials that certain lighting and certain placement of the microphone work best. • Measuring sound and light levels in play setting before play starts. • See also SOCIAL SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses.*
Measuring/Collecting, Recording Data	• Measuring the water temperature when developing photographs. • Using a sound level device to find the quietest area of the room for making a recording or to test the level of people's voices for plays or for recordings. • Using a light meter device to find out whether there is sufficient natural light for taking photographs without a flash. • Timing and recording the length of rehearsals for oral announcements. • Measuring and recording the dimensions of the stage before designing scenery for a skit. • Counting and recording the number of people who pass by a poster location at different times of day for several days. • See also MATHEMATICS list: *Measuring.* • See also SOCIAL SCIENCE list: *Collecting, Recording Data/Measuring.*
Organizing, Processing Data	• Transferring data to a chart to make it more easily read and understood. • Ordering the data on length of oral announcements from largest to smallest. • Finding the median or average number of people who pass by different poster locations each day. • Tabulating test data and displaying them on graphs. • Ordering data from smallest to largest. • See also MATHEMATICS list: *Organizing Data.* • See also SOCIAL SCIENCE list: *Organizing, Processing Data.*

Analyzing, Interpreting Data	• Calculating the probable length of an oral announcement by finding the median or average time during rehearsals. • Interpreting graphs to determine best size, types and colors for poster letters. • Finding the median, mode, range, and maximum value of sound level data. • Determining stage directions by looking at layout of stage. • Interpreting graph to determine that particular locations will be best for poster displays because of greater pedestrian traffic. • Determining the best film, best lighting, best developing procedure for photos. • Determining the best lighting and best location of camera and microphone for videotapes. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques; Graphing; Maximum and Minimum Values.*
Communicating, Displaying Data	• Showing data on various types of graphs. • Incorporating graphic charts and displays into presentations. • See also MATHEMATICS list: *Graphing.* • See also SOCIAL SCIENCE list: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Generalizing/Applying Process to New Problems	• Applying skills learned from using one medium of communication to using another medium to tell about the same problem or topic. • Applying skills learned from communicating one problem or topic to communicating another problem or topic. • See also SOCIAL SCIENCE list: *Generalizing/Applying Process to Daily Life.*

Areas of Study

Measurement	• Learning to read measuring devices accurately. • Using a stopwatch to time the steps in developing photographs. • Using a stopwatch to time the length of intercom announcements. • Using sound level meter to measure sound intensity. • Using light meter to measure light intensity.

Measurement (cont.)	• Observing the difference in length of time between minutes and seconds when timing the length of their Super-8 movie. • Measuring, using a ruler or meter stick, when laying out a poster design. • Using standard and nonstandard units of measure for determining camera distance. • Using various units of volume to measure amount of water needed for developing photographs. • Measuring temperature with Celsius (or Fahrenheit) thermometers. • Determining when a measurement is accurate enough for a certain purpose. • See also *Designing and Constructing Measuring Devices and Equipment; Measuring/Collecting, Recording Data*.
Force	• Observing that more force must be used to cut several pieces of paper than to cut one sheet. • Observing that force must be used to hammer nails and that the hammer increases the force exerted. • Observing that saber saws are faster and require less effort to operate than hand saws when cutting Tri-Wall or lumber.
Friction	• Observing that a blade becomes warmer when a piece of Tri-Wall or wood is sawed vigorously because doing work against the force of friction generates heat. • Observing that a photograph feels slick to the touch because smooth surfaces generate less friction than rough ones. • Observing, while sanding wood, that the smoother the wood, the less resistance it offers to the motion of the sandpaper.
Weight	• Observing that weight is a measure of gravity, which pulls objects towards the earth, when taping posterboard to a wall.

Mechanical Work and Energy	• Observing that light energy and sound energy are transformed into electromagnetic energy when videotapes are made. • Observing that using hand saws requires energy. • Observing that electrical energy is transformed into mechanical energy when power tools are used. • Observing that sound energy is transformed into electrical energy when sound level meters are used. • Observing that light energy is transformed into electrical energy when light meters are used. • Observing that light energy is transformed into chemical energy when photos are made. • See also *Motion* and *Force*.
Solids, Liquids, and Gases	
States of Matter	• Observing that some media supplies are in solid form and others are in liquid form. • Observing that glue is available in solid or liquid forms which have different properties. • Observing that heat from a glue gun turns a cool stick of glue into hot liquid glue.
Properties of Matter	• Observing that various construction materials, such as lumber or Tri-Wall, have different textures, densities, colors that make them useful for different tasks. • Observing that paper materials available for making posters and flyers have different colors and different weights. • Observing, while mixing tempera paints or dyes, that dry powder mixes uniformly with water. • Observing that liquids have no form of their own but take the shape of the container they are in. • Observing that fine powders dissolve easier than large lumps. • Observing that substances dissolve faster in liquids when stirred. • Observing that different types of film react differently to the chemicals in developers. • Observing that special materials are used for film strips, film, and videotapes.
Electricity	• Observing that plugging in the videotape machine allows the equipment to be turned on.

Electricity (cont.)	• Observing that tape recorders, saber saws, and other electrically powered devices go on when the switch is closed and go off when the switch is open. • Observing that electricity can be transformed into mechanical energy (tape recorder, saber saw) or into heat energy (glue gun). • Observing that electricity does not flow through insulation in wires. • Observing that different brands of batteries used for cameras and tape recorders have different lifetimes.
Heat/Temperature	• Observing changes in temperature of water for developing photos by reading a thermometer. • Observing that media equipment, such as the tape recorder and videotape playback, generate heat when turned on because electrical energy is transformed into heat energy.
Light	• Observing that paints and papers come in different colors, caused by the reflection of light of a given color and the absorption of light of other colors by the pigment in the paint or paper. • Observing that murals, posters, and other signs may attract more attention and be more legible at a greater distance if the colors are bright and contrasting. • Observing that signs and posters are more easily read in well-lighted areas because objects become visible as light is reflected from them to the eye. • Observing that chemical energy of batteries can be transformed to light energy, e.g., in a flashbulb. • Observing that a glare is produced and interferes with photography when a light source shines directly on a shiny, smooth surface. • Observing that the side of a room near the windows is brighter than the rest of the room and that the intensity of illumination decreases as the distance from the light source increases. • Measuring light levels using a light meter. • Observing that variations in light level affect the lightness or darkness of photographs. • Observing that the lens of a camera (still or video) is used to form an image of an object or a scene that is smaller than the original object or scene.

	Sound	- Measuring sound levels using professional sound-level meters or tape-recorder meters. - Observing that the loudness of a recorded sound is affected by the sound-level control on the recorder, both when recording and playing back. - Observing that noise from an adjacent classroom will sometimes be picked up on a recording. - Observing that sounds differ in tone, pitch, loudness, and quality. - Observing that a sound becomes less intense as it moves away from its source. - Observing that sound readily travels around objects. - Observing that some of the electrical energy supplied to power tools is transformed into sound energy (noise).

ACTIVITIES IN MASS COMMUNICATIONS UTILIZING SOCIAL SCIENCE

Process	
Observing/Describing/Classifying	• Observing and describing people's reactions to various media presentations. • Organizing and classifying types of mass communications, types of potential audience members, steps to be undertaken to complete a media presentation. • Observing and describing characteristics of professional media presentations. • See also MATHEMATICS list: *Classifying/Categorizing.* • See also SCIENCE list: *Observing/Describing; Classifying.*
Identifying Problems, Variables	• Identifying problem or topic that needs to be communicated to many people, e.g., traffic rules for bicyclists. • Identifying people who need to know, or would be interested in knowing, about the problem or topic. • Identifying variables that might affect which media the class chooses to use, e.g., availability of equipment, cost of supplies, amount of expertise required, suitability for intended audience, amount of time to organize and carry out presentation, and effectiveness of medium in conveying message. • Identifying problems that arise during preparation of media presentation, such as blurred print on dittoed newsletter. • See also SCIENCE list: *Identifying Variables.*
Manipulating, Controlling Variables/Experimenting	• Conducting opinion surveys, using stratified samples. • Conducting opinion surveys of different groups (adults and students, males and females) to determine media preferences. • Conducting tests of audience both before and after presentation (pretest and posttest). • Conducting trial runs of media presentations. • See also SCIENCE list: *Manipulating, Controlling Variables/Experimenting.*
Inferring/Predicting/Formulating, Testing Hypotheses	• Inferring from results of surveys that certain groups should be the target audience, that certain preferred media should be used, that some presentations convey

Inferring/Predicting/Formulating, Testing Hypotheses (cont.)	information better than others. • Hypothesizing that certain groups of people will be attracted to particular presentations; testing hypothesis by checking results of survey. • Hypothesizing that the results of a sample survey reflect the opinions of all members of a partucular group; testing hypothesis by taking a larger sample and comparing results with those from the smaller sample. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses.*
Collecting, Recording Data/ Measuring	• Counting number of people reached by a particular medium. • Collecting data on the availability of equipment, amount of expertise required, cost of supplies, amount of time to organize and carry out presentation. • Recording survey or questionnaire results on tally sheets, bar graphs, or histograms. • Using a voting procedure to determine which media to use. • See also MATHEMATICS list: *Measuring.* • See also SCIENCE list: *Measuring/Collecting, Recording Data.*
Organizing, Processing Data	• Tallying votes to determine which media to use. • Ordering results of preference surveys from most popular to least popular. • Preparing cost and time analysis for different media presentations. • See also MATHEMATICS list: *Organizing Data.* • See also SCIENCE list: *Organizing, Processing Data.*
Analyzing, Interpreting Data	• Comparing qualitative information gathered from interviewing various groups of people. • Determining preferred media by using a rating scale on survey results. • Determining the most effective medium by comparing results of pretests and posttests on content conveyed by presentation. • Evaluating survey methodology, size and makeup of sample. • Comparing data obtained from different groups of people or from samples of different size. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques; Graphing; Maximum and Minimum Values.* • See also SCIENCE list: *Analyzing, Interpreting Data.*

Communicating, Displaying Data	• Representing survey data and questionnaire data on graphs or charts. • See also MATHEMATICS list: *Graphing*. • See also SCIENCE list: *Communicating, Displaying Data* • See also LANGUAGE ARTS list.
Generalizing/Applying Process to Daily Life	• Using one's knowledge of comparative shopping for media supplies in formulating personal buying habits. • Using knowledge acquired from taking opinion surveys to help solve other problems where attitudes are important. • Using knowledge acquired from communicating a topic or problem to get people concerned or to inform them about other problems or topics. • Gaining insight into the problems of creating and producing a media presentation. • Concluding that working together in a group gives faster, more accurate, and more imaginative results than working individually. • See also SCIENCE list: *Generalizing/Applying Process to New Problems*.

Attitudes/Values

Accepting Responsibility for Actions and Results	• Making sure that various tasks (e.g., administering surveys, learning to operate media equipment, arranging to have supplies available when needed, cleaning up after group work) are done. • Scheduling and giving media presentations.
Developing Interest and Involvement in Human Affairs	• Recognizing that a particular topic or problem needs to be communicated to many people. • Seeking ways to communicate with many people about a particular problem or topic.
Recognizing the Importance of Individual and Group Contributions to Society	• Recognizing that communicating their message will help other people as well as themselves. • Assessing the effects of group action in communicating with a large number of people.
Developing Inquisitiveness, Self-Reliance, and Initiative	• Conducting group sessions with help from the teacher. • Dealing with merchants in obtaining supplies and equipment for their media presentations.

Developing Inquisitiveness, Self-Reliance, and Initiative (cont.)	• Finding their own solutions to problems encountered in addition to the main problem of the challenge. • Choosing and developing the best way of presenting a plan to the principal or to other persons in authority.
Recognizing the Values of Cooperation, Group Work, and Division of Labor	• Finding that work on putting together a media presentation progresses more rapidly and smoothly when work is done in groups. • Eliminating needless overlap in work by setting priorities and planning ahead. • Finding that work can be fun when people cooperate.
Understanding Modes of Inquiry Used in the Sciences; Appreciating Their Power and Precision	• Using scientific modes of inquiry to investigate and solve the problem of putting together a media presentation. • Convincing others that their suggested solution should be accepted through the use of supporting data, graphs, and charts. • See also MATHEMATICS and SCIENCE lists.
Respecting the Views, Thoughts, and Feelings of Others	• Considering all suggestions and assessing their merits. • Considering the opinions of others; recognizing that people's opinions vary. • Recognizing that compromise solutions are sometimes necessary. • Recognizing and respecting differences in values according to age, experience, occupation, income, interests, culture, race, religion, ethnic background. • Respecting the thoughts, interests, and feelings of members of the opposite sex when working in groups.
Being Open to New Ideas and Information	• Considering alternative ways of performing various tasks. • Conducting research to find out additional information about topic or problem that is being communicated. • Asking other people for opinions, ideas, and information.
Learning the Importance and Influence of Values in Decision-Making	• Recognizing that cost effectiveness alone is not sufficient in considering a solution; effects on people must also be considered. • Realizing that preferences for various media reflect the values of each individual.

Learning the Importance and Influence of Values in Decision-Making	• Recognizing that different groups of prople in the target audience may have different values that affect their preferences for media which must be considered in any solution.
Areas of Study	
Anthropology	• Observing and describing language characteristics related to cultural and geographic background.
Economics	• Using economic concepts and terms, for example, cost, discount, retail price, wholesale cost, when purchasing media equipment and supplies. • Gaining experience with finance: sources, uses, and limitations of revenues for the purchase of media equipment and materials. • Investigating costs of equipment versus use of equipment and budget restrictions. • Gaining experience in comparative shopping for materials; analyzing costs.
Geography/Physical Environment	• Making and using maps of the school, the neighborhood, and nearby areas when determining poster placement and number of posters to be made and displayed.
Political Science/Government Systems	• Getting in touch with and working with school authorities for permission to give media presentations. • Investigating regulations and policies affecting a planned media presentation, for example, distributing flyers in the community.
Recent Local History	• Investigating previous attempts to convey information about the same topic or problem.
Social Psychology/Individual and Group Behavior	• Developing a gimmick to attract people to media presentations. • Recognizing and using different ways of approaching different groups, such as students and administrators. • Recognizing need for leadership within small and large groups. Recognizing differing capacities of individuals for various roles within groups.

Social Psychology/Individual and Group Behavior (cont.)	• Analyzing the effects of a small group making decisions for a larger group.
Sociology/Social Systems	• Devising a system of working cooperatively in small and large groups. • Investigating problems and making changes that affect not only themselves, but society (other students in the school, people in the community, etc.). • Working within established social systems to promote changes. • Experiencing and understanding differences in social systems, in different social groups (children, adults, women, men). • Recognizing that there are many different social groups and that one person belongs to more than one social group.

ACTIVITIES IN MASS COMMUNICATIONS UTILIZING LANGUAGE ARTS

Basic Skills

Reading: Literal Comprehension--Decoding Words, Sentences, and Paragraphs	• Decoding words, sentences, and paragraphs while reading opinion surveys; drafts of letters; dialogues for plays and announcements; instructions for use of media equipment; newsletter, poster, and flyer texts.
Reading: Critical Reading--Comprehending Meanings, Interpretation	• Obtaining factual information about topic or problem being communicated; about use of media, sound, and light. • Understanding what is read; learning meaning of new words. • Interpreting what is read; distinguishing between fact and opinion. • Following written directions.
Oral Language: Speaking	• Offering ideas, suggestions, and criticisms during discussions in small group work and class discussions on problems and proposed solutions. • Reporting to class about data collection, use of a particular medium and any problems encountered, scale-drawing activities, graphing, etc. • Responding to criticism of activities; answering questions. • Preparing and giving effective oral presentations of survey questions, methods, findings, and suggested solutions. • Learning to speak before an audience; pronouncing words clearly and distinctly. • Using the telephone properly and effectively to obtain information or to invite a resource person to speak to the class. • Conducting oral opinion surveys. • Using new words learned in a proper context. • Preparing, practicing, and giving skits, plays, slide/tape shows, public address announcements, videotapes, etc. • Using rules of grammar in speaking. • Giving oral directions on use of media equipment and supplies, on finding locations for poster displays, on best route to follow when seeking location of presentation. • Asking questions to obtain additional information; phrasing question to elicit type of information desired.

Oral Language: Listening	• Listening to reports of small group activities, to presentations of other groups. • Listening to responses while conducting opinion surveys or questionnaires. • Following spoken directions. • Listening to commercial presentations.
Oral Language: Memorizing	• Memorizing portions of oral presentations; memorizing roles in skits, plays, videotapes, films, etc. • Memorizing steps to follow in developing film.
Oral Language: Spelling	• Using correct spelling in preparing reports, letters, dialogues for oral presentations, and all written presentations such as posters, booklets, newsletters, flyers.
Written Language: Grammar--Punctuation, Syntax, Usage	• Using rules of grammar in writing reports, letters, presentations. • Using new words learned in proper context.
Written Language: Composition	• Writing to communicate effectively: • preparing opinion surveys and questionnaires; devising questions to elicit desired information; judging whether a question is relevant and its meaning clear. • preparing written reports and letters, using notes, data, graphs, etc., communicating importance of proposed topic or problem. • writing skits, plays, announcements, newsletter and book articles, and text for posters and flyers.
Study Skills: Outlining/Organizing	• Taking notes when consulting resource materials or people about use of media equipment. • Taking notes on suggestions for improving a presentation. • Developing opinion survey; ordering questions around central themes, such as audience preferences for particular media. • Planning and organizing a media presentation. • Planning and preparing drafts of letters, dialogue or texts for presentations, and reports for critical review by the class before final copy is written. • Organizing ideas, facts, data for inclusion in letters, reports, presentations, etc.

Study Skills: Using References and Resources	• Using the library to research for information on using media equipment and making media presentations. • Using reference volumes, such as a dictionary or encyclopedia, to locate information. • Using indices and tables of contents of books to locate desired information. • Inviting experts on the topic or problem or experts on using various media to speak to the class and answer questions. • Using "How To" Cards for information on graphing, using a stopwatch, making a scale drawing, etc.

Attitudes/Values

Appreciating the Value of Expressing Ideas Through Speaking and Writing	• Finding that classmates and teacher may approve of an idea if it is presented clearly. • Finding that school officials or others in authority may be persuaded to approve proposed changes or to incorporate them into their plans. • Finding that a large number of people can be informed about a topic or problem by using a mass media presentation, such as a newsletter. • Finding that a written letter or a telephone conversation evokes a response from people, for example, the principal, parents, city officials.
Appreciating the Value of Written Resources	• Finding that certain desired information on light, sound, or media presentations can be found in books and written materials.
Developing an Interest in Reading and Writing	• Willingly looking up information on making a media presentation. • Showing a desire to write an opinion survey, letters, reports. • Volunteering to write scripts for plays, skits, announcements or articles for newsletters or books.
Making Judgments Concerning What is Read	• Deciding whether what is read is relevant to the particular problem, e.g., spotted photographs. • Judging reliability of information; distinguishing between fact and opinion.

Making Judgments Concerning What is Read (cont.)	• Deciding whether written material developed by the class is appropriate for the intended audience, whether it says what it is supposed to say, whether it needs improvement.
Appreciating the Value of Different Forms of Writing, Different Forms of Communication	• Finding that certain data or information should be written down so that it can be referred to at a later time. • Finding that best method of communicating is determined, in part, by the intended audience. • Finding that oral messages are sometimes better than written messages, oral instructions are sometimes better than written instructions, and vice versa. • Finding that certain data can best be conveyed by writing them down, preparing graphs or charts, etc., or using other accompanying visual objects such as photographs or drawings.